Introduction
Cancer is a group of diseases that is defined as the uncontrollable cell growth, invasion to local tissues, and systemic metastasis. The incidence rate of cancer has constantly been increasing over the past 50 years. Nowadays, breast cancer is the most important health concern among women, since it is the most prevalent cancer and the second most important cause of cancer death after the lung cancer among women. In Iran, breast cancer accounts for 21.4% of all cancer cases. Post-breast cancer chemotherapy has the most significant effects on the patients' quality of life. The failure to have proper control over these complications results in the aggravation of the negative effects on the quality of life in these patients, and it is likely that this aggravation nullifies every single advantage obtained from the increased survival as a result of the increased medical costs and side effects.

ABSTRACT
Background and Aim: Breast cancer is one of the most common cancers and most deadly malignancies among the women all over the world. The diagnosis, treatment, and complications arising from this cancer bring about numerous physical, mental, and social complications as well reduced quality of life in these patients. The present study aims at investigating the effect of training problem-based learning on the quality-of-life symptom scales in patients suffering from breast cancer. Materials and Methods: In a randomized controlled clinical trial, 50 breast cancer patients hospitalized in the oncology ward of Tohid Hospital of Sanandaj, Iran. The patients were randomly divided into two groups: experimental and control. Experimental group patients were trained according to problem-based learning, but no specific measure was conducted on control group patients. Right after the training course, the patients' quality of life was measured once more by using the abovementioned questionnaires, and the data collected were analyzed by using statistical tests. Results: The mean age of the samples was 44.22 ± 10.32. The findings of the study indicate that there was a significant statistical difference between the two groups in the quality-of-life symptom scales before the intervention and after conducting it (P < 0.05). Moreover, as for the breast cancer-specific quality-of-life symptom scales, there was no significant statistical difference between the two groups both before and after the intervention (P < 0.05). Conclusion: The findings obtained in the present study indicate that training problem-based learning had a positive effect on the quality-of-life symptom scales in women suffering from breast cancer. This training method can be applied as a part of normal measures taken for the patients alongside other medical measures.

Keywords: Breast cancer, problem-based learning, quality of life

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are important to the individual, and it includes areas that have
to do with health, occupation, economy, society, mental status,
and family. There is an interactive relationship between disease
and quality of life. Physical disorders as well as the symptoms
arising from these disorders have direct effect on all aspects
of quality of life. By considering the effects arising from
breast cancer and their treatments, it seems that the common
treatments affect the clients’ quantity of life, and given the
effects arising from the complications of the treatment, they will
affect other aspects of the life of the clients including quality
of life. The progress of treatment has proved to be effective
in the long-term survival as well as a better control over the
disease and its complication. There are many cancer patients
for whom chemotherapy is the mere treatment conducted. For
other cancer patients, chemotherapy is conducted with radiation
therapy and surgery. However, most of the patients deal with
a wide variety of symptoms and side effects including nausea,
vomiting, pain, insomnia, anorexia, and fatigue. Moreover,
psychosocial problems and disorders are often associated with
the diagnosis of cancer, and these problems affect the patients’
quality of life. In their study, Chen et al. indicated that all
samples of the study called for the investigation of tumor
markers and scanning for the prevention and recurrence of
the disease. Moreover, as many as 56% of them were worried about
the symptoms of their disease. As many as 42% suffered from
limitations in sexual intercourses and 57% of them called for
the improvement of body image and reconstructive surgery.
In another study, Safaie et al. used a multivariate analysis and
indicated that there was a significant relationship between tumor
differentiation level, occupational status, menopausal status,
dyspnea, and economic problems with the total quality of life.
However, in their study, Tabari et al. indicated that the quality
of life of most patients was appropriate in terms of physical,
mental, and socioeconomic aspects.

Applying nonpharmacological interventions such as training,
doing sports, and counseling together with pharmacological
interventions will result in significant effects in the quality of
life of patients suffering from breast cancer. In this regard, in
their study, Baghaei et al. indicated that an educational package
of controlling the complications of chemotherapy resulted in
the reduction of symptom scales of quality of life in the
intervention group (in comparison to the control group). Moreover,
Karimvey et al., Patell et al., and Salehi et al. have conducted similar studies in this regard. Nurses and midwives are
the individuals who provide educational services to these patients
and deal with them in different periods, and they can help the
patients improve their quality of life by providing appropriate
and continuous training and counseling.

Different techniques are used as nonpharmacological interventions for the improvement of patients’ quality of life. One of these methods is group training. One of the most popular group training methods is problem-based learning. Problem-based learning is a method in which learning process occurs through the attempts made for understanding or solving

Materials and Methods

The present study is a randomized controlled clinical trial conducted on the breast cancer patients hospitalized in the oncology ward of Tohid Hospital of Sanandaj in 2016. The statistical population of this study includes all breast cancer patients hospitalized in the oncology ward of Tohid Hospital. They had referred to receive chemotherapy (outpatient and hospitalized). The inclusion criteria of this study include the age range of 20–65 years, patients’ cooperation, filling out informed consent letter to participate in the training program, having no history of chronic diseases, having no history of using drugs, having no history of mental problems, and enjoying appropriate physical health. The exclusion criteria of this study are failing to cooperate, dissatisfaction with participating the study, having critical physical conditions, having a history of chronic diseases, using drugs, and having a history of mental diseases.
The samples included the patients having all qualifications for being included in the statistical population. The sampling was conducted by using convenience sampling method. The researchers identified the number of breast cancer patients by referring to the oncology ward of Tohid Hospital of Sanandaj. This procedure was conducted until the sample size was completed. The samples were then randomly divided into two groups of case and control according to the random number table. Based on the aforementioned studies conducted,[20] by considering $\mu_1 = 16.92$, $\mu_2 = 10.75$, $\sigma_1 = 59.24$, and $\sigma_2 = 45.68$ with the type I error of 0.05 and type II error of 0.20, the sample size was determined to be 20 for each group. A total of 40 samples were selected in 2 groups. For avoiding the likelihood of sample attrition, the number of the samples increased to 50. Thus, as many as 50 individuals were studied.

At first, the samples’ quality of life was studied in both groups by using the questionnaires. Then, the case group’s participants were trained problem-based learning based on a planned program in 4–5 individual groups for five 60–90-min sessions during the hospitalization. No training was provided to the control group. At the end, after the end of intervention, the samples filled out the questionnaires once more. The training material of the present study was provided in two parts. In the general section, the material included fatigue, nausea, vomiting, pain, painful breathing, sleep disorder, anorexia, diarrhea, constipation, and economic problems. In the specific section, the material included symptom scale, sexual performance, the individual's image of the future, and the individual's self-image.[19] Moreover, the intervention was conducted in eight stages. (1) First, the basic information on the problem to be trained was explained by the trainer, and the patient was then asked to provide some hypotheses based on his information and experiences. (2) The trainer provided the patient with the information needed to meet the questions asked by the patient. (3) The trainer asked the patient to discuss his main problems based on the studies conducted and the information collected. (4) The trainer asked the patient to plan for measures and introduce them. (5) The trainer asked the patient to discuss his scientific defects preventing him to understand the problem. (6) On his own discretion, the trainer gave the patient an opportunity to work on the intended problem based on the method he has selected. The trainer guided the patient. The patient is then expected to discuss a problem, the solutions, and the conducting method of the solutions. (7) The patient discussed every change made on the problem, and given the priorities, he/she discussed a problem with all details. (8) In this stage, the patient explained what he had done independently during the study. The patient explained the information specifically determined in the understanding of the problem and explained why they were useful to him/her.[19]

For data analysis, SPSS software (IBM Corporation) version 23 was used. Descriptive statistics such as mean, standard deviation, frequency, and cumulative frequency percentage were used for analyzing the data for descriptive purposes. For analyzing the data for analytical purposes, Kolmogorov–Smirnov test indicated that the distribution of the quantitative variables was normal ($P > 0.05$). Paired $t$-test was used to study the difference in the mean of the variables both before and after the intervention in every group. Independent $t$-test was used to investigate the difference in the mean of the variables both before and after the intervention in both groups. For investigating the correlation (or lack of correlation) between the variables, Pearson correlation coefficient was used.

All the patients studied received an informed letter of consent containing the method of conducting the study, and all participants consented to participate in this project by signing the letter of consent. The patients’ information was kept confidential. Moreover, coded unnamed questionnaires were used to secure confidentiality. To maintain ethical considerations, educational pamphlets were provided for the patients of the control group as well.

**Results**

The patients’ mean age was $44.22 \pm 10.32$. Eighteen percent (9 patients) of the samples were single, 68% (34 patients) of the samples were married, 8% of the samples (4 patients) lost their spouses by death, and 6% (9 patients) were divorced. Most of the patients were illiterate (13%) and had an average income (24%). Most of the patients studied were housewives (66%) and husbands were self-employed (60%). About 38% of the participants had no children, and 38% of them had more than three children. Twenty-six percent of the patients had a history of special diseases, and 24% of them had no history of being treated for special diseases.

The score of the means ranges from 1 to 4. Lower scores indicate a better level of quality of life. The findings of the study, as shown in Table 1, indicate that there was a significant difference in terms of cancer-specific quality-of-life symptom scales of the intervention group before and after the intervention ($P < 0.05$). Moreover, there is a significant statistical difference between the two groups in terms of all general quality-of-life symptom scales of cancer, except for diarrhea ($P = 0.143$) before and after the intervention ($P < 0.05$).

According to Table 2, there was no significant difference in the intervention group in terms of cancer-specific quality-of-life symptom scales before and after the intervention ($P > 0.05$). However, in the experimental group, after conducting the intervention, the mean scores of different quality-of-life symptom scales reduced, and this resulted in a significant statistical difference in terms of all cancer-specific quality-of-life symptom scales (except for the symptoms of arm, $P = 0.08$). Moreover, there was a significant statistical difference between the two groups in terms of all cancer-specific quality-of-life symptom scales before and after the intervention.
Table 1: The general quality-of-life symptom scales of cancer

| Symptom scales                | Mean and standard deviation preintervention | Mean and standard deviation postintervention | Paired t | t | df | Mean and standard deviation preintervention | Mean and standard deviation postintervention | Paired t | t | df |
|------------------------------|--------------------------------------------|---------------------------------------------|---------|---|----|---------------------------------------------|---------------------------------------------|---------|---|----|
| Fatigue                      | 5.72±1.36                                  | 5.80±1.32                                   | 1.445   | 24|     | 5±1.11                                     | 4±1.19                                     | 0.009   | 24|    |
| Nausea and vomiting          | 5.64±1.18                                  | 5.68±1.31                                   | 0.327   | 24|     | 4.40±0.76                                  | 4.40±0.76                                  | 0.000   | 24|    |
| Pain                         | 5.52±1.38                                  | 5.36±1.22                                   | -1.163  | 24|     | 5.20±0.86                                  | 4.36±0.56                                  | 0.001   | 24|    |
| Dyspnea                      | 2.72±0.73                                  | 2.76±0.72                                   | -1.000  | 24|     | 2.48±0.50                                  | 2.16±0.47                                  | 0.04    | 24|    |
| Sleep disorder               | 2.76±0.77                                  | 2.72±0.67                                   | 0.440   | 24|     | 2.08±0.40                                  | 2.08±0.40                                  | 0.000   | 24|    |
| Anorexia                     | 2.84±0.68                                  | 2.64±0.70                                   | 2.449   | 24|     | 2.24±0.52                                  | 2.24±0.52                                  | 0.07    | 24|    |
| Constipation                 | 2.60±0.70                                  | 2.72±0.67                                   | 1.365   | 24|     | 2.04±0.61                                  | 2.04±0.61                                  | 0.011   | 24|    |
| Diarrhea                     | 2.72±0.67                                  | 2.56±0.65                                   | 2.138   | 24|     | 2.32±0.47                                  | 2.32±0.47                                  | 0.024   | 24|    |
| Financial problems           | 2.60±0.57                                  | 2.64±0.56                                   | 3.674   | 24|     | 2.08±0.40                                  | 2.08±0.40                                  | 0.000   | 24|    |

Table 2: The (breast) cancer-specific quality-of-life symptom scales

| Symptom scales                 | Mean and standard deviation preintervention | Mean and standard deviation postintervention | Paired t | t | df | Mean and standard deviation preintervention | Mean and standard deviation postintervention | Paired t | t | df | Independent t |
|-------------------------------|--------------------------------------------|---------------------------------------------|---------|---|----|---------------------------------------------|---------------------------------------------|---------|---|----|----------------|
| Sadness from hair loss        | 2.84±0.62                                  | 2.76±0.59                                   | 1.000   | 24|     | 2.24±0.43                                  | 2.24±0.43                                  | 0.000   | 24|    | 4.571          |
| Complications of the treatment| 26.68±4.02                                 | 26.68±4.02                                  | -1.163  | 24|     | 19.84±2.26                                  | 19.84±2.26                                  | 0.000   | 24|    | -8.046         |
| Symptoms of the arm           | 5.44±1.35                                  | 5.44±1.35                                   | 0.000   | 24|     | 4.40±0.59                                  | 4.40±0.59                                  | 0.008   | 24|    | -1.804         |
| Symptoms of the breast        | 5.52±1.29                                  | 5.56±1.22                                   | 0.371   | 24|     | 4.40±0.57                                  | 4.40±0.57                                  | 0.005   | 24|    | -3.068         |

Discussion

In the present study, in addition to determining the individual characteristics and the status of the disease, it was attempted to investigate the effect of training problem-based learning on the quality-of-life symptom scales in patients suffering from breast cancer. The quality of life was investigated in two aspects (general and specific) with their own symptom scales. The postintervention changes made in the quality-of-life symptom scales indicated that training problem-based learning affected the quality of life in the intervention group’s patients. Since the two groups were not significantly different in terms of demographic variables, it can be confidently stated that the changes made in the quality of life of the intervention group’s patients were resulted from the intervention.

The findings obtained from the data analysis indicated that the pre- and postintervention quality-of-life symptom scales increased significantly in terms of the symptom scales in all aspects ($P < 0.05$). In their study, Baghaei et al. indicated that an educational package of controlling the complications of chemotherapy resulted in the reduction of symptom scales of quality of life and improved quality of life in the intervention group (in comparison to the control group) ($P < 0.005$), and this confirms the findings of the present study. However, in their study, no significant difference was resulted in terms of fatigue ($P = 0.241$) and financial problems ($P = 0.132$). The lack of significant difference for fatigue in the study conducted by Baghaei et al. is likely owing to the multidimensional concept of fatigue resulting from cancer and the chronic and permanent nature of fatigue in these patients. Thus, short term is not merely sufficient in reducing the cancer patients’ fatigue. The lack of significant difference for the financial problems in the study conducted by Baghaei et al. is likely owing to the huge costs of chemotherapy drugs during the study and the researchers’ failure to solve the patients’ economic problems. The findings of the study conducted by Karimvey et al. in Tehran indicated that group training resulted in improved quality-of-life symptom scales in terms of nausea and vomiting, anorexia, constipation, diarrhea, dry mouth, and gustatory changes in the patients of the intervention group.[13] The findings of their study were consistent with those of the present study. In this regard, the findings of the studies conducted by Patell et al. in Italy[14] and Bakhshi et al.[15] on the reduction of symptom scales and improved quality of life were consistent with the findings of the present study. In another study conducted in Golestan Hospital of Ahvaz, Salehi et al. indicated that the Benson’s relaxation program resulted in the promotion of all quality-of-life symptom scales except for the financial problems.[16] The findings of the aforementioned study confirm those of the present one. The findings of the aforementioned study are similar to those of the present one in that the researcher applied the relaxation methods as one of the educational programs in the patients’ general training program. Samice Siboni et al. investigated the effect of family counseling on the quality-of-life symptom scales in breast cancer women undergoing chemotherapy. They indicated that family counseling resulted in the reduction of chemotherapy complications such as fatigue, nausea and vomiting, pain, painful breathing, sleep...
disorder, anorexia, constipation, diarrhea, and financial problems. Thus, the findings of the aforementioned study confirmed those of the present study.[23]

As for the cancer-specific quality of life, the findings of the present study indicated that there was a significant statistical difference between the two groups (before and after the intervention) in terms of all cancer-specific quality-of-life symptom scales ($P < 0.05$). The findings of the study conducted by Baghaei et al.[19] and Hazrati et al.[24] confirmed the findings of the present study. However, in their study, Azh et al. indicated that the intervention had no significant effect on the quality-of-life performance and symptom scales in women suffering from breast cancer ($P > 0.05$).[25] The reason behind this difference is likely the inclusion criteria of the study conducted by Azh et al. In the aforementioned study, conducting mastectomy was one of the inclusion criteria of the study. This can indicate the chronic nature of the disease as well as longer period of suffering from that. Thus, conducting intervention before mastectomy will significantly affect the educational methods conducted for the clients. Moreover, since the number of trainings sessions was more than that of the study conducted by Azh et al., it is likely that more training sessions have been more effective. The kind of educational method has been effective as well. In their study, Samiee Siboni et al. have indicated that family counseling has reduced the specific breast cancer and chemotherapy complications such as the symptoms of breast, arm, and hair loss worry. Their study confirmed the present study as well.[25]

Since the samples of the present study include breast cancer patients, the stressful events that were not predicted can affect the findings of the study as intervening and damaging factors. Thus, the researcher attempted to control the patients’ emotions and reduce their anxiety through expressing the facts during the training. Moreover, given the samples’ wide range of age, the learning process in the samples was considered as a limitation. For reducing this limitation, it was attempted to place the patients in the same age group to be trained.

**Conclusion**

Given the findings of the present study, it can be concluded that training problem-based learning had a positive effect on the quality-of-life symptom scales in women suffering from breast cancer, and this training resulted in the significant improvement in these patients. Alongside other medical measures, this method can be regarded as a part of the normal measures conducted for the patients.

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**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Taghdisi MH, Abdi N, Shahsavari S. Health promotion among cancer patients by the Problem Based Learning (PBL) method. J Health Syst Res 2011;7:434-41.
2. Badrian M, Ahmadi P, Amani M, Motamedi N. Prevalence of risk factors for breast cancer in 20 to 69 years old women. Iranian J Breast Dis 2014;7:67-75.
3. Sharifi M, Mikaili P, Baghaei R, Hajilou M, Mohammadpour Y. Evaluation of the effect of chemotherapy on functional scales of quality of life of patient with breast cancer. Iranian J Breast Dis 2013;6:36-34.
4. Seyedpoori T, Zahmatkesh T, Malea T, Akbari P, Haqi Z, Mohsenizad P. Assessment of breast cancer risk with Gill models. Iranian J Breast Dis 2008;14:605-6.
5. Pakpour Haji Agha A, Panahi Chonaghbolaghi D, Yekaninezhad S, Nourouzi S. Assessment of quality of life in patient with esophagus cancer. Payesh 2009;8:371-8.
6. Pookryani M, Hazrati M, Abbas Zadeh A. Is the inability to improve the quality of life for people with breast cancer. Payesh 2009;9:61-8.
7. Henry DH, Viswanathan HN, Elkin EP, Traina S, Wade S, Cella D. Symptoms and treatment: Results from a cross-sectional national survey in the US. Support Care Cancer 2008;16:791-801.
8. Yazdani F, Babazadeh Sh. The effect of the yoga program on the quality of life in breast cancer patients. Iranian J Breast Dis 2013;6:58-66.
9. Chen HL, Wang X-C, Wang J-B, Zhang J-B, Wang Y. Quality of life in patients with breast cancer and their rehabilitation needs. Pak J Med Sci 2014;30:126-30.
10. Safaie A, Zaghimi B, Tabatabaie HR, Moghii Dekkordi B. Quality of life and its influencing factors in breast cancer patients undergoing chemotherapy. Iranian J Epidemiol 2007;3:61-6.
11. Tabari F, Zakeri Moghadam M, Bahrani N, Maqani Z. Evaluation of the quality of life in newly recognized cancer patients. Hayat 2007;13:5-12.
12. Shobeyri F, Nik ravelsh A, Masoomi SZ, Heydari Moghadam R, Karami M, Badafareh M. Effect of sport counseling on the quality of life scales of women with breast cancer. J Educ Community Health 2013;5:2-1.
13. Baghaei R, Sharifi M, Mohammadpour Y, Sheykhi N. Evaluation of the effects of educational package on controlling the complication of chemotherapeutic agents on symptom scales of quality of life in patients with breast cancer undergoing chemotherapy. J Urmia Nurs Midwifery Fac 2013;11:667-79.
14. Karimvey MH, Poodrehghan M, Jadid Milani M, Forootan SK, Aeen F. The effect of group counseling on the quality of life
of patients with breast cancer under chemotherapy in Imam Khomeini Hospital of Tehran. J Mazandaran Univ Med Sci 2006;16:43-51.

15. Patell MN, Goldin D, Aggujaro M. Nutritional concerns of cancer patients and the families. Eur J Oncol Nurs 2009;1:171-9.

16. Salehi M, Shariati A, Ansari M, Latifi SM. Effect of Benson’s relaxation on significant scales of quality of life in patients with breast cancer under chemotherapy. J Chronic Dis Jundishapur 2012;1:1-8.

17. Sabahi R. Introduction to Problem Based Learning (PBL). Management of Medical Education Development journal. Isfahan University of Medical Science 1998;(4):46-52.

18. Bahmanpour K. The effect of education on critical thinking skills, critical thinking factor, attitudes and behavior, graduate student through problem-based learning. Nursing. Medical and surgical orientation. Tehran University of Medical Science 2003;(2);84-90.

19. Memarian R. Problem-based learning(PBL). Journal of HAYAT 1999;5:76-80.

20. Mohammadi Arya A, Pakdaman M, Abolghasemi S, Rezaee M, Pashaee T, Ghareh Tapeh A. The effect of stress inoculation group training on hope and quality of life in women with breast cancer. J Res Dev Nurs Middwifery 2014;11:8-16.

21. Heravi Karimou M, Poordehghian M, Jadid Milani M, Frotan SK, Aeen F. The effect of group counseling on the quality of life of patients with breast cancer under chemotherapy in Imam Khomeini Hospital of Tehran. J Mazandaran Univ Med Sci 2006;16:43-51.

22. Bakhshi M, Memarian R, Azad Fallah P. The effect of progressive muscle relaxation on the dosage of antiemetic drug in cancer patients undergoing chemotherapy. Horizon Med Sci 2009;15:5-12.

23. Samiee Siboni F, Anoshe M, Alhini F. The effect of family counseling on the quality of life of women with breast cancer under chemotherapy. Iranian J Breast Dis 2010;3:29-39.

24. Hazrati M, Poor Keiani M, Abaszadeh A, Jaafari P. The effect of rehabilitation in quality of life in women after mastectomy. Armaghan Danesh 2007;12:90-9.

25. Nasal A, Javadi A, Mahmood Babaee M, Rezaee F, Honardar A. The effect of education in the field of current care and care of breast cancer on the quality of life of patients with breast cancer referred to oncology clinic of Kowsar Hospital in 2011-2011. Iranian Breast Cancer J 2011;5:60-70.