

Original Article

The effect of exercise on physical aspect of quality of life in breast cancer patients undergoing chemotherapy

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Abstract

BACKGROUND: Breast cancer is the most common cancer among women in the world and chemotherapy is the most common therapeutic approach for it. However, chemotherapy has many side effects which deteriorate patients' quality of life. This study aimed to find the effects of exercise on quality of life among breast cancer patients undergoing chemotherapy.

METHODS: In this clinical trial study, 60 breast cancer patients undergoing chemotherapy at the Seyed Alshohad Hospital in Isfahan were selected. The patients were randomly divided into two groups of intervention and control. Both groups completed a questionnaire of quality of life before the intervention. The intervention group had six weeks of exercise. At the end of exercise intervention, all patients of the two groups completed the quality of life questionnaire again. Data were analyzed via SPSS₁₅ software using independent and paired t-test.

RESULTS: In the intervention group, even though the mean score of physical aspect of quality of life was increased, the difference was not significant ($p = 0.107$). The mean score of physical aspect of quality of life in the control group was decreased, but there was no significant difference between the physical aspect of quality of life before and after the intervention ($p = 0.187$). After the intervention, the mean score of the physical aspect of quality of life was significantly higher in the intervention group ($p = 0.001$).

CONCLUSION: This study showed that exercise intervention is useful for enhancing physical aspect of quality of life in breast cancer patients undergoing chemotherapy.

KEY WORDS: Breast cancer, chemotherapy, quality of life, exercise

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The word "cancer" refers to more than 200 diseases. It is caused by unusual growth and multiplying of the cells.¹ Statistics have showed that cancer is the second main cause of death in the developing countries.¹ Breast cancer is the most common cancer in women. It is responsible for 32% of deaths in women between 20 to 59 years of old and it is the second cause of death among women of all ages.² Studies showed that breast cancer is the most common cancer among Iranian women in all provinces of Iran, except Ardebil. In general,

breast cancer includes 41.24% of women cancers in Iran and 93.25% of women cancers in Isfahan.^{3,4}

Cancer treatment depends on the type and progress of the cancer and is usually a combination of surgery, radiotherapy, chemotherapy and biological therapies.⁵ Despite the main role of chemotherapy in managing and controlling breast cancer,⁶ it has a series of side effects including oral mucositis, bone marrow suppression, hair loss, nausea, vomiting, losing appetite and diarrhea⁷ which increase the patients' emo-

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tional tensions, disrupt their physical and social activities, and decrease their quality of life.⁸

The new cancer treatments are more aggressive and increase the rate of cure,⁹ but they increase the side effects too; therefore, it is necessary to have some interventions to improve the quality of life in patients undergoing these treatments.¹⁰ One of the useful interventions is exercises, known as the main component of rehabilitation after chronic diseases¹¹ and considered as successful interventions in improving the quality of life and decreasing the mortality rate.¹⁰ Physical exercises increase cardiovascular tolerance, muscle power and body inflexibility, and lead to a healthy heart and body. Stretching loose up muscles, remove toxins and increase blood circulation. Moreover, exercise decreases stress hormones, comforts the body and helps it to fight stress. Exercise has a special position in US health care programs.¹² In several recent years, it is a tendency to use exercise as an intervention in rehabilitation of cancer patients¹³ while before that, such patients were advised to rest as much as possible and avoid physical activities.¹⁴ Structured exercise programs have positive effects on the cancer patients in physical and emotional aspects.¹⁵ Several studies revealed that these interventions decrease fatigue and increase the ability of patients with breast cancer.¹⁶ It is showed that regular physical activities reduce most of the cancer caused problems and help patients to stay independent as much as possible.¹⁷ This is while the lack of physical activities is a usual problem in cancer patients undergoing chemotherapy.¹⁹

The exercise programs used in some of previous studies were home-based. In these studies, the patients' adherence to the advised program cannot be evaluated. Therefore, it is necessary to use supervised exercise program to clarify the effects of exercise on the quality of life in patients with cancer. Also, these interventions were not used as a part of caring and treatment process in cancer. In Iran, there is no exercise intervention to improve the patients' quality of life; and the studies on this field are all from those countries with different socio-

cultural characteristics. Therefore, this study aimed to find the effects of exercise on quality of life among breast cancer patients undergoing chemotherapy.

Methods

In this clinical trial study, 60 breast cancer patients undergoing chemotherapy at the Seyed Alshohad Hospital in Isfahan, Iran from September 2007 to February 2008 were selected via convenient method and randomly divided into two groups of intervention and control. Inclusion criteria built-in age between 30 to 55 years, diagnosis of breast cancer at least one month before the study, undergoing modified radical mastectomy in stage I and II, having chemotherapeutic regimes (AC, CAF, CEF) for at least one session, and being in the functional level of 0 to 1. Exclusion criteria included metastasis, anti-coagulant therapy, history of cancer other than breast cancer, suffering from dementia and other psychotic disorders, undergoing radiotherapy, heart diseases such as myocardial infarction in past 3 months and congestive heart failure, anti-arrhythmic medications and regular exercise in past 2 months for 2 to 3 times a week.

To assess the participants' quality of life, the standard instrument of the National Medical Center and Beckman Research Institute was used which assess the patients' quality of life in four aspects: physical, psychological, social and spiritual. The content validity and the internal consistency were used to assure the validity and reliability of the instrument respectively. Also the Cronbach's alpha was 0.80 before the intervention for the 10 cancer patients undergoing chemotherapy. These 10 patients were excluded from the study.

Before the intervention, the quality of life questionnaire was completed for both groups. written consent was obtained from all of the subjects in intervention group.

The intervention group had 6 weeks of exercise while the control received usual cares. According to the declaration of the Journal of American College of Sport Medicine, at least 6-7 weeks of exercise is needed for intervention to

get significant results. Likewise, the other declaration of this journal suggests that 3 to 4 exercise sessions per week are enough for men and women.²⁰ Kornia et al recommend specifically 20 to 30 minutes continuous exercise, 3 to 5 days per week for cancer patients.²¹ A review of various studies revealed that exercise interventions with low to moderate intensity (55% to 85% of the maximum heart beat) is appropriate for cancer patients.²² In this study, the exercise interventions included 3 sessions in 30 minutes per week for 6 weeks. Also, according to the style of American College of Sport Medicine, the researcher designed a structured supervised exercise protocol including warm up, aerobic exercise and cool down.

The exercise sessions were done one by one. In the first 7 minutes, a nurse guided the patient for stretching and bales tic moves to warm up. This part included a series of dynamic moves to activate big groups of muscles.²³ In the next stage, the aerobic moves were done for 7 minutes, calm and jogging on a electronic treadmill which showed the heart rate and the used calories. Then for another 7 minutes, the patients cycled on a fixed magnet bicycle with heart beat monitoring. Heart rate was used to control the intensity of exercise activities; it was planned as 55% of intensity in the first and second weeks, 65% in the third and fourth weeks and 75% in the fifth and sixth weeks. In the third stage and to cool down, patients did stretching and bales tic moves like those of the first stage. This stage was also 7 minutes. All of the exercise parts were done under the guidance of research assistants

Before intervention and at the end of 6 weeks exercise intervention, the questionnaire of life quality was completed by the patients in both groups.

In addition to independent variable (exercise intervention) and dependent variable (quality of life scores), other variables such as age, education, history of regular exercise before and after disease diagnosis, duration of diagnosis, body mass index (BMI), and chemotherapy regime were considered as well.

Data were analyzed using SPSS¹⁵. To compare the mean score of physical aspect of life quality within groups, paired t-test, and to compare physical aspect of quality of life between groups, independent t-test was used.

Results

There was no significant difference between the two groups in demographic variables. The results of comparing the mean score of physical aspect of life quality before and after intervention within and between the groups of the study are shown in table 1.

In the intervention group, even though the mean score of physical aspect of quality of life was increased after the intervention, the paired t-test showed that the difference was not significant ($p = 0.107$).

The mean score of physical aspect of quality of life in the control group was decreased, but there was no significant difference between the physical aspect of quality of life before and after the intervention ($p = 0.187$).

After the intervention, the mean score of the physical aspect of quality of life was significantly higher in the intervention group ($p = 0.001$).

Discussion

The results showed that after the intervention, there was a significant difference among the scores of physical aspect of quality of life between the intervention and control groups. This is the same as Thorsen et al study that shows

Table 1. Comparing the mean score of physical aspect of life quality within and between the groups

Group	Mean score (SD)		Paired t-test
	Before intervention	After intervention	
Intervention	57.25(15.04)	64.12(14.52)	$t = 1.66, p = 0.107$
Control	53.66(13.23)	49.04(10.95)	$t = 1.35, p = 0.187$
Student t-test	$t = 0.97, p = 0.33$	$t = 4.54, p = 0.001$	

increasing oxygen uptake and decreasing score of fatigue after exercise intervention.²⁴ Kim et al found that the cardiopulmonary responses (decrease of resting heart rate, resting systolic and maximum systolic blood pressure and increase of maximum energy usage) improved just in the intervention group.¹⁶ Results of Monga et al study showed that the two groups were significantly different in heart balance, power, flexibility and physical health.²⁵ Headley et al showed that exercise intervention help the patients to lose less physical aspect of quality of life compared with the controls.²⁶ It can be concluded that exercise has a useful effect physical aspect of quality of life in breast cancer patients.

In the present study the scores of physical aspect of quality of life were not significantly different before and after intervention in each of two groups. However, Clark et al showed that those patients reported to have regular physical activities had a better physical aspect of quality of life compared with those whose life style had fewer activities. They also had less symptoms and physical complains.²⁷ Monga et al showed that cardiac fitness, fatigue, physical health, flexibility and leg strength in the exercise group improved, and the scores of fatigue in the control group increased significantly.²⁵ Milne et al in surveying breast cancer patients found that the score of fatigue in delayed exercise group in the sixth and seventh weeks (before the exercise intervention) was going up. When they started the intervention in this group, the scores decreased in the 18th and 24th weeks. Also, the score of fatigue in the immediate exercise group decreased from the beginning to the 24th week.²⁸

The results of this study showed that exercise intervention can improve the quality of life

of breast cancer patients in physical aspect; Physical aspect of quality of life in control group decreased which can be caused by the side effects of treatments; even though the treatments are the same for the patients in both intervention and control groups.

Although the results of this study showed no significant difference within the two groups, the improvement of quality of life in the intervention group and the decrease of quality of life in control group have provided enough evidences for the effectiveness of the intervention.

In general, the strongest evidence for the effectiveness of exercise on cancer patients is related to the physical aspect of quality of life. Many studies assessed the effects of exercise on cancer patients, especially breast cancer patients, and found positive and even significant effects of the exercise on the physical aspect of life quality in these patients. A more careful review of the results of these studies, revealed that even in cases with no statistically significant difference, there was still improvement in the intervention group. The reason for the positive effects on physical aspect can be related to the fact that this aspect is more measurable compared with other aspects of quality of life and also the health care services pay more attention to it; so nurses and other health care providers often focus on physical abilities of the patients more than other aspects.

Considering the results of the present study, it is clear that there are many evidences for the effectiveness of exercise on various aspects of quality of life in the cancer patients.

The Authors declare that have no conflict of interest in this study and ethical committee approved the study.

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