Can Yoga be Considered as an Effective Supportive Psychological Intervention with an Impact on the Quality of Life for Breast Cancer Survivors?

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Abstract

Introduction: The aim of this study was to address the current lack of knowledge regarding the effects of yoga, an ancient oriental science, on reduction of stress and increase of Quality of Life (QoL) for breast cancer patients.
Patients and methods: 27 breast cancer patients, who had completed their standard medical therapies, including surgery (modified radical mastectomy), chemotherapy and radiotherapy, were recruited from the Mehrane Charity Centre. The patients were randomly assigned to a yoga intervention group (n: 16) or a wait list (control group) (n: 11) for 32 sessions (16 weeks) of a yoga program. The pre- and post-yoga quality of life assessments for the patients were conducted using the Iranian Version of the EORTC QLQ-BR23 questionnaire.
Results: After 16 weeks of yoga intervention and evaluation of physical, social, emotional, functional, sexual and body image well-being, it was revealed that our experimental group (mean age of 48.5±6.6 years old) had a significant decrease in emotional and sexual disturbance and experienced an improvement in positive body imaging compared with the control group (mean age: 46.9±8 years old) (P value<0.05). Furthermore, significant improvement in functional, emotional, and body image well-being was observed after yoga intervention in the experimental group in comparison to baseline condition (P value<0.05).
Conclusion: : Results of this study provide evidence for beneficial effects of a yoga program on the quality of life among breast cancer survivors.
Keywords: Yoga, Breast cancer, Quality of life.

Introduction

Breast cancer is the most common type of cancer among women worldwide, and accounts for approximately one-fifth of all deaths in women aged 40–50 years [1,2,3,4]. Thus, it imposes great stress to the patients after diagnosis. Treatments of breast cancer have improved rapidly in recent decades, and patients have increased disease- free survival. Increased life expectancy of patients on one side, and treatment complications on the other side, have led to many psychological difficulties. These difficulties include fatigue, anger, panic, anxiety and depression [5,6,7].The range of anxiety disorder prevalence in breast cancer varies from 1 to 49%, while depressive disorder ranges from 1.5 to 46% [6,7,8]. Worries

about the future, varying physical symptoms and functional loss as the result of cancer or its treatment can dramatically affect patients' quality of life sociologically, psychologically, and economically[9,10]. Previous reviews of the literature have indicated that psychological intervention and life skill training may help cancer patients by increasing their knowledge about their disease and treatment[11,12].

Yoga is an ancient oriental spiritual program, based on methods of relaxation for self-regulation, distress reduction, physical postures practice, breathing techniques, and meditation. Yoga promotes at least three therapeutic processes: invigoration, acceptance, and relaxation[13,14]. The word yoga is derived from the Sanskrit root Yuj, which means "to join" or "to yoke". Yoga is one of six branches of classical Indian philosophy and has been practiced for thousands of years. The Indian sage Patanjali categorized the different methodologies of yoga into 196 aphorisms called "The Yoga Sutras"[15]. The Sutras include 8 parts: Amas (ethical disciplines), Niamey (individual observances), Asana (body postures), Pranayama (breath exercise), Pratyahara (senses withdrawal), Dharana (concentration), Dhyana (meditation), and Samadhi (enlightenment) [16].

Mechanisms of yoga that promote health status are based on these factors:

1) Autonomic balance establishment, 2) Hypometabolic states and neuro-endocrine development, 3) Physical efficiency improvement, 4) Cardiopulmonary function improvement, 5) Improved immunological tolerance, 6) Mood states improvement [17,18,19,20,21,22,23,24,25,26].

Yoga increases patients' capability to control their body in order to master mental functions of their brain, which may have physical and psychological benefits for both healthy and chronically ill individuals[27,28,29]. Yoga is a psychotherapeutic intervention that has been used effectively in numerous situations where stress plays a role in mood disturbance[30, 31].

It seems that we need more knowledge about the effects of physiological intervention from a yoga program on breast cancer patients who have completed their medical therapies (modified radical surgery) and are experiencing a new period of their life along with cancer. This encouraged us to conduct an investigation to evaluate the effects of yoga as a stress reduction program that would improve the quality of life and future life expectancy for those breast cancer patients who have undergone surgical treatment.

Patients and method

This article describes a randomized clinical trial of yoga intervention for women with breast cancer. It was approved by the ethical committee of Zanjan University of Medical Sciences and conducted in the Oncology Department. All patients in this clinical trial were supported by the Zanjan Mehrane Charity, a society for patients suffering from cancer.

Study population

This is a single center, randomized controlled trial of 27 adult women diagnosed with breast cancer, who were recruited from 2009 to 2010. In Zanjan Province, all cancer patients including those with breast cancer are registered in the Zanjan Mehrane Charity, a supportive society devoted to patients suffering from cancer. A public announcement was made for this clinical trial.

Twenty seven volunteers who met the eligibility criteria were selected by researchers and enrolled in this study, then they were randomized into experimental (n: 16) and waitlist-control groups (n: 11). These patients had completed standard cancer therapies including surgery, modified radical mastectomy (MRM), chemotherapy and radiotherapy (if indicated), and at the time of study, they were only consuming anti-estrogen medication. Eligibility criteria included: age>18 or <60 years old, diagnosed with breast cancer stage I, II, III, completed breast cancer therapy (surgery, chemotherapy and radiotherapy) and high performance state (PS>90). Patients were excluded if they had less than six months life expectancy, or were consuming anti-depressants during the previous six months, or had a history of serious psychiatric disorders such as schizophrenia, major anxiety or depressive disorders, or any other medical illness interfering with yoga practice, or those involved in any active yoga practice during the previous 6 months.

All patients who had been registered in the charity for less than three months were also excluded from the plan. The details of the study were explained to the participants and informed-consent was obtained. All subjects were asked to complete a questionnaire with their demographic and medical information.

Yoga intervention

Yoga intervention, consisting of 16 weeks (32 sessions) of group classes, each lasting for 90 minutes, was conducted in the Yoga Home center in Zanjan, led by 2 certified yoga masters (registered with the National Yoga Association) and under the supervision of one of the co-authors or oncologists. The Yoga masters had been trained in a traditional and professional school of Yoga (Payam-e-Mehr) and had more than 15 years of extensive experience teaching yoga and meditation techniques to patients with different medical problems as well as to the healthy public. Each 90 minute session consisted of a gentle physical stretching posture (asana), breathing exercise (pranayama), and meditation technique (dhyana). During the sessions, teachers explained about the importance of fine and gentle postures and practices to minimize injuries. Patients were supplied with CDs and illustrated handbooks for yoga practice and were encouraged to spend time during the day to continue the assigned exercises on their own.

Measurement

EORTC QLQ-BR23 (The European Organization for Research and Treatment of Cancer Core) Cancer Quality of Life Questionnaire was used to evaluate patients' reports of quality of life. In this study, we evaluated subjects with the EORTC breast cancer-specific quality of life questionnaire (EORTC QLQ-BR23); the translated and validated Iranian version of the questionnaire revised by Dr. Montazeri31, and this questionnaire was used without any changes.

The questionnaire was a 53-item adjective checklist to assess physical (20 questions), emotional (14q), functional (7q), body image (4q) and sexual (3q) well-being of subjects. Also, three questions were designed to assess effects of cancer on social, familial and economic situations. Two questions (numbers 29 and 30) were designated to evaluate quality of life and total well-being of the patient, 7 days before filling out the questionnaire. The higher scores in physical, emotional, functional, body image, social, familial and economic situation indicated poorer health conditions. In contrast, higher scores in sexual, total quality of life and well-being (in the previous 7 days) were evaluated as a sign of better health status. Subjects completed EORTC QLQ-BR23 questionnaire just before the training workshop and again at the end of the 16-week education period.

Data analysis

Statistical analysis was carried out using the Statistical Package for Social Science (SPSS version 11). Mean values (±SEM), median and ranges are shown. Descriptive statistical methods were used where appropriate. Preliminary analyses included descriptive and bi-variant analyses (i.e., Chi 2) to examine comparability between groups on socio-demographic, medical, and baseline QOL characteristics. The effects within-groups were analyzed using a paired t test. P value<0.05 was considered significant.

Results

Demographic information is illustrated in table 1. The mean age of the women in the experimental group was 48.5±6.6 years old and in the control group was 46.9±8 years old. Most patients were housewives and more than 65% in experimental group and 46.5% in control group had a minimum of 12 years of education. All the subjects had suffered from breast cancer stage I, II, or III with no metastasis and had completed standard cancer therapy. At the time of yoga intervention, medical treatment had stopped. According to the self-reports of patients, their knowledge about yoga and its effects were negligible or very low.

Five subcategories of quality of life, including physical, emotional, functional, body image and sexual disturbance, were evaluated in the subjects of both groups before and after intervention (table 2).

Subjects' functions such as walking, bathing, cleaning, cooking and eating had no significant difference before yoga between the two groups. But they showed a great improvement after

Table 1: Demographic information of breast cancer engaged in yoga intervention program.

Character	Yoga group (n=16)	Control group (n=11)	P value (difference between 2 groups)
Age(years old)	48.5±6.6	46.9±8	Non-significant
Marital status(percent):			
Single	0	0	
Married	100	100	
Occupation (percent):			
housewife	75	81	
Retired	15	18	
Disabled	10	1	
Educational level (percent):			
Illiterate	6.2	36.3	
Elementary school	10.8	27.2	
High school	50	27.2	
University education	25	9.3	

yoga intervention in the experimental group, compared with the control group (P value: 0.02). Also, positive changes in the patients' functions were observed in the comparison before and after yoga intervention in the experimental group (P value: 0.05).

Patients' signs and symptoms, such as decentralization, tension, irritability, anxiety and pain, sleep disturbance, nausea, vomiting, and diarrhea, were assessed in the emotional well-being item. Considerable reduction in severity of emotional signs and symptoms was observed in the yoga intervened group compared to waitlist-control subjects (P value: 0.027).

Patients' positive perception of their body image was improved in the experimental group after the yoga program in comparison to that of the control group (P value: 0.04). Also, the perception of body image in the experimental group had a significant improvement in before and after paired t-test (P value: 0.031).

Other parameters, such as physical or sexual well-being, did not show any significant changes before and after intervention between the two groups.

Two questions, 29 and 30, assessed the health status of patients in the last week, and total quality of life in the previous 7 days, respectively. The questions' scores ranged from 1 (terrible) up to 7 (excellent). Although we did not find significant differences pre and post intervention between the two studied groups, the highest score of health status was five (33.3 percent). However, post intervention, the highest score was improved to six (56.2%).

In the experimental group, 13% of the subjects scored 1, 2 or 3 for their quality of life and 45% of the patients evaluated their quality of life as good (6) or excellent (7). After yoga training, the percentage of people dissatisfied with their quality of life (scores of 1, 2, 3) was reduced to 6%. Conversely, the percentage of more satisfied people in the last weeks had risen to 70 percent.

Also, the total life expectancy score did not show significant improvement in the experimental group in comparison to the waitlist-control group, but future life expectancy in 40% of experimental group members was poor (score 3) or terrible. After they went through the stress reduction program; yoga, more than 90% of the patients reported a more positive view about their future life, and the number of subjects whose future life expectancy was very bad (4), reached zero.

Effects of breast cancer on familial and social relationship and the economic status of patients were assessed in this study, but no significant changes before and after intervention were observed within the two target and control groups.

Discussion

In the recent study, we found that breast cancer patients suffered from many physical, emotional and economic disturbances, and many aspects of their quality of life, including physical, emotional, functional, body image and

Table 2: Comparison of Mean scores of psychological values within two experimental and control groups before and after Yoga intervention

value	Before yoga intervention			After yoga intervention		
	Mean±SD		P value	Mean±SD		P value
	Experimental group(n=16)	Control group(n=11)		Experimental group(n=16)	Control group(n=11)	
Functional well being	12.3±3.7[2]	13± 3.5	**0.6**	9.1 ± 1.3	12.8± 4.2	**0.02**[1]
Physical well Being	38.2 9.1	33.2± 10	**0.3**	27.2± 4.2	34.8 ± 10.6	**0.1**
Emotional well being	27 7.5	25 ± 10	**0.6**	18.9± 2.7	26.8 ± 8.3	**0.06**[1]
Body image well being	8.3 4.6	8.4± 3.3	**0.9**	5.3 ± 1.5	8.7 ± 4.5	**0.04**[1]
Sexual well being	6 1.6[3]	4.5± 1.3	**0.03**	6.1± 1.2	6.2± 2.1	**0.9**

1- P value<0.05 is considered significant.
2- Mean scores of 4 values of functional, emotional, physical and body image indicated severity of disturbances. The Higher score in 4 values, the poorer psychological condition.
3- Higher mean score of sexual value indicated better situation.

sexual performance, were influenced negatively by their cancer.

Anxiety and depressive symptoms were among the highest before surgery and were significantly correlated with preoperative stressful events[32]. For example, more than 50% in the experimental group and 40% in the control group mentioned that their economic circumstances were affected by cancer, and 30-40% of patients were considerably worried about their future life. Therefore, in addition to improving conditional therapies for breast cancer patients, the tendency is growing to use new palliative psychotherapeutic intervention such as cognitive-behavioral group therapy, supportive-expressive group therapy and life skill training.

Researches demonstrated that yoga may affect physical and emotional health in a number of patient populations with chronic exhausting illnesses such as asthma, cardiovascular disease, arthritis, multiple sclerosis, headache, depression, diabetes, pain disorders, gastrointestinal disorders, and addictions[33].

A randomized, controlled trial of yoga was conducted in Australia on 59 patients with moderate to severe asthma. Intervention group participants undertook Sahaja yoga, as a meditative practice that does not include postures or breathing, whereas the control group received instructions on relaxation methods, group discussion, and cognitive behavior therapy exercises for 2 months. Significant improvements in mood and reduction in fatigue was observed in the post-intervention group[33].

Garfinkel and colleagues also studied Yoga interventions among subjects with musculoskeletal conditions[34]. Forty two individuals with carpal tunnel syndrome received an Iyengar yoga intervention that focused on upper body postures to improve flexibility and correct hands, wrists, arms, and shoulder alignment. After the 8-week intervention, participants in the yoga group showed significant improvements in pain and in certain signs of carpal tunnel syndrome (e.g. Phalen sign), whereas control group participants showed no significant changes in these measures[35].

Not only has Yoga intervention shown its effectiveness in improving physical illnesses, but also these beneficial effects have been observed for psychological disorders. An investigation

conducted by a research team in India, on patients with untreated melancholic depression who randomly received SudarshanKriya yoga with breathing exercises, showed significant improvement in depressed mood in comparison to the control group[36,37,38]. Furthermore, two randomized trials found that yoga interventions, including posture, breathing, and relaxation and meditation exercises, demonstrated significant reductions of anxiety, stress and depression among college and medical students[39,40].

In the recent years, investigators have been encouraged to examine the effects of yoga among cancer patients and survivors[32].

In our investigation, we tried to add a supportive psychological treatment. Practicing yoga, including relaxation, self-regulation and breathing techniques along with physical posture improvement, could elevate remarkably patient's functional capacities for all daily tasks, such as walking, eating, bathing, and dressing.

Also, it was shown that many emotional problems, such as tension, anxiety, dyspnea, pain, sleep disturbance, weakness, loss of appetite, gastrointestinal discomforts and fatigue, subsided significantly post yoga intervention. Self-imagination, body posture and fitness were improved considerably when our patients received yoga intervention. Finally, overall future life expectancy and quality of life improved after a stress reduction program such as yoga.

One of the first studies in India examined the effects of yoga among 50 ambulatory cancer patients undergoing daily radiation therapy (lacked a control group). Simple Yogic relaxation techniques without strenuous exercises were taught in two 90-minute sessions per week. Benefits reported included improved appetite (22%), improved sleep (22%), improved bowel habits (26%), and feelings of peace and tranquility (20%)[40].

Moreover, Ninety nine patients with lymphoma, undergoing treatment, or having concluded treatment within the past 12 months, were assigned to a Tibetan yoga group or to a wait-list control group. Patients in the Tibetan yoga group participated in 7 weekly yoga sessions. Subjects in the Tibetan yoga group demonstrated lower sleep disturbance compared to patients in the wait-list control group (5.8 vs. 8.1; $P < 0.004$). Better sleep quality, faster sleep latency, longer sleep duration, and less use of sleep medications were shown in this study to be some of the benefits of yoga intervention[41].

Another randomized controlled trial of yoga among a multiethnic sample of breast cancer patients evaluated the effects of Tibetan yoga on quality of life. Analyses demonstrated that the control group had a greater decrease in social well-being compared with the intervention group, after controlling for baseline social well-being ($P<0.0001$). Analyses of 71 patients not receiving chemotherapy during the intervention period indicated favorable quality of life outcomes for the intervention group, including emotional well-being, social well-being, spiritual well-being, and distressed mood ($P < .03$) [42].

Women with breast cancer (n: 44; mean age 55.8 years) enrolled in a study by Danhauer et al about restorative yoga (34% were undergoing cancer treatment).Following the completion of 10 weeks of yoga intervention, they observed a greater benefit from the yoga activity for the women with a higher negative effect and lower emotional well-being at baseline compared with the control group. The yoga group demonstrated a significant within-group improvement in fatigue, but no significant difference was noted for the control group[42].

Vadiraja and his colleagues and Kovacic T et al, consistent with previous studies, claimed that relaxation training according to the Yoga in Daily Life system brings clinical physiotherapy benefits for breast cancer patients experiencing psychological stress[40, 43].

In another interesting outcome, the influence of yoga was investigated on the immune system performance of early stage (II, III) breast cancer patients who had undergone a surgical operation by Rao and colleagues. Subjects were assessed for self-reported anxiety, depression, treatment-related distress and quality of life prior to surgery and four weeks later. Also, in their blood samples, T lymphocyte subsets (CD4, CD8 and natural killer (NK) cell counts) and serum immunoglobulins (IgG, IgA and IgM) were analysed.

In addition to a significant drop in the state and traits of anxiety, depression, symptom

severity and distress along with improvement in quality of life in the yoga group as compared to the controls, the researchers observed a meaningful lower level of decline in CD 56 (P: 0.02), and lower levels of serum IgA (P: 0.001) in the yoga group as compared to controls following surgery[44].

Conclusions

In the recent study, we opened a novel window in supportive therapy for cancer patients who have entered a new phase of their life after completion of standard therapy (including modified radical mastectomy). The aim was to see whether such intervention could bring about meaningful changes in functional, emotional, and body image well-being after a mind-body intervention program, such as yoga. These kinds of interventions are more acceptable among cancer patients, and bring physical and psychological benefits with lower cost, such as group support, emotional exchange in patients with similar conditions and regular body exercise activities.

The results of this study provide further evidence for the beneficial effects of a yoga program on the quality of life among breast cancer patients.

Limitations:

Evaluation of patients with cancer is a challenging task and contains many restrictions. Particularly, evaluation of the psychological conditions of these patients is associated with even more difficulties. Therefore, we were faced with different limitations in the process of evaluating the psychological effects of yoga interventions on the well-being of patients. Many patients do not have enough information about effects of mental or spiritual aspects on their quality of life, or still do not believe in the power of psychological interventions such as yoga to improve or treat disease.

Hence, yoga training and practice among breast cancer patients was time consuming and difficult. In addition, it is not possible to perform these exercises in rural areas, thus only urban women were recruited into this study. Age and physical conditions allowing the patients to undergo yoga exercises were determinant factors in the selection of our study population.

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