

Emotional Aspects and Pranayama in Breast Cancer Patients Undergoing Radiation Therapy: A Randomized Controlled Trial

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ABSTRACT

Objective: Emotional disturbances are commonly experienced by cancer patients. The aim of this study was to determine the effectiveness of certain Pranayama techniques on the emotional aspects such as impatience, worry, anxiety, and frustration among breast cancer patients undergoing radiation therapy in India. **Methods:** The study was conducted as a randomized controlled trial. Patients were recruited when they were seeking radiation therapy for breast cancer. They were allocated into two groups using block randomization technique. The experimental group performed Pranayama along with radiation therapy, whereas the control group received only routine care.

Results: Emotional aspects of the two groups were compared at the end of the treatment. Mann–Whitney U-test was used for comparison as the data were not following normality. It showed a significant difference between the two groups with the group who performed Pranayama showing a lesser mean score for these negative emotions. **Conclusions:** Pranayama might help in controlling the negative emotions likely to be faced by breast cancer patients, and it can be used as a supportive therapy for breast cancer patients receiving radiation therapy.

Key words: Breast cancer, negative emotions, Pranayama

Introduction

Yoga is the union of the individual self (Jivatma) with the universal self (Paramatma). The system of Yoga was first gathered and written down by Patanjali in his Yoga Sutras

or Aphorisms. In his Aphorisms, Patanjali mentions the aim of Yoga as a liberating power from the worldly bonds. For the mind to be liberated, it has to first reach a reflective

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stage or stage of concentration. The physical practices of Yoga slowly prepare one to achieve this stage. So, first Yoga deals with the health of the body. Next it helps in the concentration of mind and for further progress. Most of the modern scientific studies are performed to exploit the effect Yoga has on human body and mind.

“Prana” means breath, respiration, or vitality. “Ayama” means to stretch, to expand or to control. “Pranayama” thus means the prolongation of breath and its restraint. Pranayama has three stages. It consists of long, sustained subtle flow of inhalation (Puraka), exhalation (Rechaka), and retention of breath (Kumbhaka). It is not just automatic habitual breathing. Subtle chemical changes take place in the disciple’s body as a result of the practice.^[1] The finer movements that are going on inside the body are connected with breathing. If we can get hold of this breathing and manipulate it and control it, we will slowly get to finer and finer motions, and thus enter into the realms of the mind.^[2]

Many scientific studies have brought out the therapeutic effects of Pranayama in different disease conditions. Yoga and Pranayama were tested among patients, caregivers, healthy volunteers, young, and old. Studies have also reported previously that Pranayama was effective in reducing cancer-related fatigue and improving the level of antioxidants among breast cancer patients.

Researchers observed that breast cancer patients admitted to our setting are also emotionally affected. Most of them are sad, worried, or anxious and confined to themselves. Hence, we assessed their emotional aspects using a structured scale. The data to be presented here were collected as part of fatigue assessment. Further analysis of the data was performed to check its effectiveness on the emotional or affective aspects.

Review of literature

The symptoms related to breast cancer and breast cancer treatment can result in disturbed body image among women diagnosed with breast cancer. Women feel breast cancer as a threat to their independence and autonomy generating psychosocial problems amongst them. Besides breast cancer diagnosis and treatment generate anxiety, fears and impair emotional function and quality of life.^[3]

Clinical and severe depressive symptoms and stress are common among women with newly diagnosed breast cancer.^[4,5] Breast cancer patients often have problems with depression, emotional well-being and concerns regarding breast cancer and they use various coping strategies to tackle these emotions.^[6] Breast cancer patients who do not express emotionally have higher rates of tension, anxiety, anger, hostility, and fatigue scores.^[7] Yoga, Pranayama, and meditation have shown effectiveness in reducing anxiety and depression among adults.^[8-11] Many other studies have

shown that Yoga and Pranayama has improved emotional well-being among patients.^[12,13] A 10-day group Yoga program (satsang [spiritual discourse], warm-up exercises, yogic asanas and Pranayama) developed in a qualitative study reduced the burden and improved coping of caregivers of patients with schizophrenia in India.^[14] Asanas, kriyas, Pranayama, meditation, lectures, yogic games, and singing resulted in significant improvement in emotional intelligence, attention, and general health of the participants.^[15]

Yoga influences all aspects of the person: Physical, vital, mental, emotional, intellectual and spiritual. Yoga helps to relax and energize. Asanas and Pranayama bring about relaxation by harmonizing the neuroendocrinal system. Thus, Yoga, Pranayama, and meditation help patients to deal with the emotional aspects of chronic pain, reduce anxiety and depression considerably and improve the quality of life.^[16]

A review on Yoga and menopausal transition explains that Yoga practices may provide a source of distraction from daily life and enhancement of self-esteem, among women to focus on the simplicity of movement and forget about work responsibility and demands, and thus reduce anxiety as well as depression. Hot flushes and night sweats among menopausal women could be controlled with the practice of Yoga and Pranayama. The Yoga therapy has also shown to improve cognitive functions such as attention and concentration, remote memory, and mental balance among these women.^[17]

Banerjee *et al.* assessed the effectiveness of an integrated Yoga program on the perceived stress levels, anxiety and depression, and radiation-induced DNA damage among 68 breast cancer patients undergoing radiation therapy. It was observed that there was a significant decrease in the anxiety, depression and stress among the Yoga group compared to the control group. There was no significant difference between the two groups with regard to radiation-induced DNA damage. It was significantly elevated in both the groups.^[12]

The anxiolytic effects of a Yoga program and supportive therapy were compared by Rao *et al.* in breast cancer patients. There were 18 patients in the Yoga group and 20 patients in the control group. Yoga group exhibited decrease in both self-reported state anxiety ($P < 0.001$) and trait anxiety ($P = 0.005$).^[18]

Sengupta in a review postulated that mind-body exercise such as Yoga produces a temporary self-contemplative mental state by sustaining muscular activity with internally directed focus. It also suppresses sympathetic activity, thus reducing stress and anxiety. Yoga has also shown to improve autonomic and higher neural center functioning and physical health of cancer patients.^[19]

Methods

Recruitment of participants

Breast cancer patients for this study were recruited when they got admitted for adjuvant radiation therapy at the cancer block of a tertiary care hospital in Southern India. For homogeneity, only those participants who have a history of surgery for breast cancer and those who have completed the course of adjuvant chemotherapy were included in this study. Breast cancer patients with diagnosed depressive disorders were excluded as it might interfere with data collection on emotional aspects.

Randomization

Institutional Ethical Committee clearance was obtained before the conduct of the study. Of the 170 eligible participants, 160 (94.11%) consented to participate and were randomized to perform Pranayama along with radiation therapy ($n = 80$) or only radiation therapy with routine care ($n = 80$). The patients were allocated into experimental group and control group using block randomization procedure (16 blocks of 10 patients) after getting informed consent. Random sequence generation and concealed allocation were achieved by using concealed and numbered envelopes.

Research design

The design adopted for the study was randomized controlled trial. As shown in Figure 1, a total of 331 breast cancer patients were assessed for eligibility. Of these, 171 patients were excluded based on the exclusion criteria. The remaining 160 were allocated to experimental group and control group using block randomization.

Pranayama technique

During the initial 6 days, patients were sent to the Yoga Department of our hospital which has Yoga trainers who taught them the Pranayama techniques and padmasana and ardhapadmasana. Patients continued the practice in a room near their ward inside the hospital under the supervision of a research staff. Total length of time of Pranayama for each session was approximately 25-30 min including shavasana (resting and relaxation posture). Patients practiced such sessions for morning and evening 6 days/week for 6 weeks till they completed radiation therapy. The Pranayama techniques practised by the patients were Brahmari, Sheethali, and Nadishodhana.

In Brahmari Pranayama, patients were taught to take deep inhalations and deep exhalations with a humming sound.

^[1] In Sheethali Pranayama, patients were taught to draw in air slowly and deeply through a curled tongue which is stretched out of the mouth. After the inspiration, the tongue is withdrawn and the mouth is closed and they were asked to

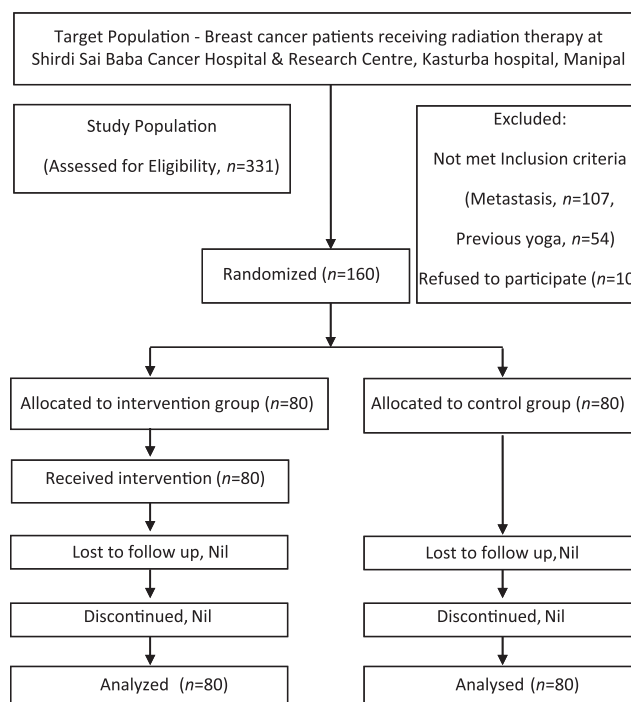


Figure 1: Consort flow diagram of randomized controlled trial

exhale passively through the nose. Those who had difficulty in making a curled tongue were taught to draw in air slowly and deeply through clenched teeth and exhale passively through the nose.^[1] In Nadishodhana Pranayama, the patients were taught the following procedure. The right hand is brought to the nostrils. Left nostril is blocked completely with the ring finger and small finger of the right hand without disturbing the septum. Patients were instructed to exhale through the right nostril slowly, steadily and deeply and inhale through the same side in the same way. When the inspiration is completed, the right nostril is blocked with the thumb of the right and they were asked to exhale slowly and steadily through the left nostril. Once the exhalation is completed through the left nostril, patients were instructed to inhale slowly and steadily through the same nostril. Again they were asked to slowly and steadily exhale through the right nostril. This completed one cycle of Nadishodhana Pranayama.^[1]

Patients performed Nadisodhana for approximately 5 min (21-25 cycles), Sheethali for approximately 5 min (50-60 cycles) and Brahmari for approximately 8 min (10 cycles). The resting posture Shavasana was given for 8-10 min.

While doing Pranayama, the patients were taught to sit on the floor in Padamasana. Those who had difficulty sitting in Padmasana were sitting in ardhapadmasana or sitting on a chair with the leg dangling and with the spine straight. No additional equipment or furniture was used for obtaining postures. The patients were not compelled to do any other postures as the researchers felt that it might put undue physical strain on them.

Assessments

Assessment of emotional aspects was performed using five items as part of the assessment of cancer-related fatigue. The scale had five eleven point items (0-10, with 0 indicating least negative emotion). The items were:

- To what degree are you now feeling tired?
- To what degree are you now feeling impatient?
- To what degree are you now feeling worried?
- To what degree are you now feeling anxious?
- To what degree are you now feeling frustrated?

Content validity of the scale was done by giving it to experts. Reliability of the scale was established in the study setting by applying it to 20 breast cancer patients undergoing radiation therapy. Reliability was calculated using Cronbach's alpha. The scale was found to be reliable (0.82). The minimum score of these items was zero and the maximum score was 50.

These questions were asked to the patients with breast cancer at the beginning of radiation therapy and 6 weeks after at the completion of radiation therapy. The emotional aspects were assessed for all the patients; those who performed Pranayama and those who did not perform Pranayama during the course of treatment.

Results

The data presented in Table 1 show that majority of the breast cancer patients, i.e., 140 (87.5%) out of 160 were in the stages of stage 2 and stage 3. Most of the patients, i.e., 123 (76.87%) have undergone modified radical mastectomy as the surgical treatment. There was more number of patients belonging to ≤ 45 years in the control group.

Data in Table 2 show that most of the breast cancer patients had issues with emotional aspects. The highest scored item was "to what degree are you now feeling worried?"

As shown in Tables 3 and 4, there was a significant difference in the emotional aspects of breast cancer patients between the control group and experimental group. Patients who performed Pranayama along with radiation therapy reported fewer amounts of worry and anxiety. It can also be noted from Tables 2 and 4 that there was no difference in the scores of negative emotions among the control group.

Discussion

Awaiting a breast cancer diagnosis itself is stressful and tiring for women. They go through a lot of emotional turmoil during diagnosis, during the treatment and even thereafter.^[20,21]

In our settings, the breast cancer patients get adjusted to diagnosis and treatment mainly because of family support.

Though some authors have reported that social support for breast cancer patients can enhance their adjustment to acceptance of illness, in our setting there are no separate social support groups.^[22,23] Breast cancer patients and their families here are aware about the importance of taking modern treatments such as surgery, chemotherapy, and radiation treatment. However, they also look for the support from complementary therapies while undergoing treatments. Since Yoga and Pranayama are not unfamiliar to the general public here, there was wide acceptance among patients as well.

It was reported that Pranayama was effective in reducing cancer-related fatigue.^[24] Pranayama was also found to increase the level of antioxidants in these patients.^[25]

Table 1: Demographic characteristics of breast cancer patients in experimental and control group

Characteristics	Frequency (%)	
	Experimental (n = 80)	Control (n = 80)
Age, years		
<45	46 (57.5)	35 (43.75)
>45	34 (42.5)	45 (56.25)
Stages of breast cancer		
Stage 1	12 (15)	8 (10)
Stage 2	38 (47.5)	40 (50)
Stage 3	30 (37.5)	32 (40)
Surgery		
Modified radical mastectomy	63 (78.75)	60 (75)
Breast conservation	17 (21.25)	20 (25)

Table 2: Description of the scores of emotional aspects at pretest

Variable	Group	Median	IQR
Emotional aspects	Experimental	10	4-16.25
	Control	8	5-13.5

IQR: Interquartile range

Table 3: Description of the scores of emotional aspects at posttest for experimental and control group

Items	Experimental group		Control group	
	Median	IQR	Median	IQR
Tiredness	6	1-8	12	5-13
Impatience	4	0-6	8	4-13
Worry	1	0-3	7	5-12
Anxiety	1	0-3	7	5-12
Frustration	3	1-6	6	4-13

IQR: Interquartile range

Table 4: Effectiveness of pranayama on the scores of emotional aspects at posttest

Variable	Group	Median	IQR	Z	P
Emotional aspects	Experimental	3	0-9	-3.410	0.001
	Control	8	4-13		

IQR: Interquartile range

This study found improvements in emotional aspects of breast cancer patients. Patients who were doing Pranayama along with radiation therapy reported less worry, anxiety, and frustration. These findings are similar to a study carried out by Vadiraja *et al.* among patients with breast cancer undergoing radiation therapy which reported significant improvements in emotional and cognitive function and positive affect as a result of Yoga.^[26] We also observed that the negative emotions such as impatience, worry, anxiety, and frustrations could be reduced among breast cancer patients with the use of Pranayama.

There was a significant decrease in the state and trait of anxiety, distress, depression, symptom severity, better self-efficacy, positive attitude, and improvement in the quality of life among breast cancer patients and survivors with the performance of Yoga.^[27,28] This is in accordance with our study results that there was a significant reduction in emotions such as worry, anxiety, and frustration among breast cancer patients who performed Pranayama ($P < 001$).

On the contrary, another study conducted by Chandwani *et al.* among breast cancer patients during radiation reported that there were no improvements in the scores of fatigue, depression, or sleep among the Yoga group.^[29]

Patients with ovarian or breast cancer have noted the value of the social aspects of the Yoga classes.^[30] We have not assessed social aspects of Yoga. The patients were brought together in a separate room of the hospital for practising Yoga. They were very happy to come together and often discussed their problems openly with each other. This could probably be due to the wide acceptance of Yoga and Pranayama locally. The intervention was taught to the control group participants after the study was completed.

The researchers feel that calling the patients separately in a group to practice Pranayama for half an hour, morning and evening for 6 weeks could have given an opportunity for them to interact with each other and to discuss their problems. Patients practiced Pranayama under the supervision of the research staff for all the 6 weeks. Pranayama was supervised mainly to avoid fault in the techniques and also to make sure that the patients performed the complete sessions throughout. Other than that special attention with regard to the emotional aspects or any other treatment aspects were not given to the patients by the researchers. The improved emotional aspects reported by these patients were because of the time they spent doing Pranayama where they could concentrate only on their breaths thereby controlling the thoughts. Doing these breathing exercises repeatedly helps to calm the mind.^[1]

Oncology nurses witness the emotional struggle cancer patients go through in accepting the diagnosis and also throughout treatment. It is a journey travelled alone by each individual. However, there are no coordinated efforts

to address these problems except probably a psychiatric consultation.

Emotional aspects should be assessed by nurses at regular intervals for patients who are under therapy for cancer. Periodic monitoring of such patients is a must to prevent them from slipping into depression.

Yoga and Pranayama if used as adjuncts in the treatment of breast cancer patients can help in reducing emotional turmoil among them. It is cautioned that Yoga and Pranayama may be advised only under the guidance of a certified practitioner, and it may be a challenge in settings where there are no certified practitioners to guide the patients. Though Pranayama appears to be simple breathing techniques, there can be unwanted effects if not practised correctly, where the importance of guidance comes into play.^[31] It is important to provide the patients with privacy and a calm and peaceful environment.

Limitations

Though the study design adopted is randomized controlled trial, it was conducted only in one center. Pranayama only is tested as an intervention to improve emotional aspects; Yogasanas (physical postures) were not tested. At the conception stage, the researchers were uncertain whether the patients will have difficulties in performing Yogasana (physical postures).

Conclusion

Based on the study findings, we conclude that Pranayama can be used as an adjuvant therapy for breast cancer patients undergoing radiation therapy.

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Conflicts of interest

There are no conflicts of interest.

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