



Effectiveness of Yoga on Quality of Life of Breast Cancer Patients Undergoing Chemotherapy

Dr. Kamli Prakash^{1*}, Dr. Sunil Saini², Dr. Sanchita Pugazhendi³

¹*Professor, Himalayan College of Nursing, Swami Rama Himalayan University, Email: kamliprakash@srhu.edu.in

²Professor, Director, Cancer Research Institute, Swami Rama Himalayan University, Email: sunilsaini@srhu.edu.in

³Professor, Himalayan College of Nursing, Swami Rama Himalayan University, Email: spugazhendi@srhu.edu.in

***Corresponding Author:** - Dr. Kamli Prakash

*Professor, Himalayan College of Nursing, Swami Rama Himalayan University, Dehradun,
Email: kamliprakash@srhu.edu.in

KEYWORDS

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ABSTRACT:

Introduction: Among cancer of different organs in the body, the carcinoma of the breast is highest in occurrence worldwide, after lung cancer. It occurs mostly in women. While undergoing chemotherapy women have side effects which affects their quality of life. Yoga practices comprising of relaxation techniques reduce many side effects and improve the quality of life of women undergoing chemotherapy.

Material and methods: Quantitative Research approach and Randomized Controlled study with Time series design was followed. The consecutive sampling technique was used to enroll 100 breast cancer patients. Enrolled patients were randomized into control (N=52) and experiment (N=48) groups by concealed randomization. Written informed consent obtained from each study participant. Baseline data on quality of life was collected during cycle one by using EORTC QLQ BR 23. The patients in the experimental group were taught Diaphragmatic breathing, systematic relaxation and alternate nostril breathing and Joints and Glands neck and shoulder exercises and were instructed to practice them twice daily at home. They were supervised in practicing these when they received second, third, fourth, fifth and sixth cycles of chemotherapy. Participants in control group received routine care. Data on quality of life was again collected after 21 days during second, third, fourth, fifth and sixth cycles of chemotherapy.

Results: Results showed that at baseline the patients in the control and the experimental groups were having similar mean scores in components of Functional and Symptom Scales. There was significant difference between the groups with regards to body image, Future Perspectives, Systemic therapy side effects, Breast symptoms, Arm Symptoms, Upset by hair loss.

Conclusion: Yoga intervention was effective improving the quality of life of breast cancer patients in experimental group with respect to the perception of body image and future perspectives and decreasing the adverse effect symptoms of chemotherapy and arm & breast symptoms, distress caused by alopecia, i.e. hair loss, during the period of chemotherapy.

Introduction

Cancer is a cluster of diseases portrayed by unavoidable development and multiplication of unusual cells in the body. (American Cancer Society 2017) ¹

Worldwide, among the many causes of human death, the primary cause is cancer. There was an average of 8.8 million deaths in the year of 2015 due to cancer. The main cancers resulting in deaths were lung cancer, liver, colorectal, stomach and breast cancer. (WHO 2017)²

According to world Health Organization data in the year 2020, 2.3 million women were diagnosed to have cancer of breast and there were 685,000 deaths worldwide. By the end of the year 2020, around 7.8 million females were living with diagnosis of breast cancer in the past five years, revealing that breast cancer is the most common cancer in the world. Breast cancer occurs in women living in all the countries of the world at any age after attainment of puberty but mostly in later years of life.³



Breast cancer is the most common cancer among females worldwide. In the year 2020 the cases of breast cancer were more than lung cancer making it most common cancer worldwide, with estimated 2.3 million new cases, making it 11.7% of all cancer cases.⁴ According to data from Globocan 2020, of all cancer cases there were 13.5% cases of breast cancer and 10.6% of all mortality in India with 2.81 cumulative risk.⁵

Manoharan N. et al. (2017) reported based on Delhi's cancer data registry. In 2012 a total nineteen thousand seven hundred and forty-six people were registered as having cancer. In women the most common location of cancer was in the breast, which accounted for 28.6%, in women who were in their 5th decade of life. The greater prevalence was among females who resided in cities in comparison to those residing in villages. This might be because of late marriage, giving birth to first baby late, having less parity, and greater social and economic conditions.⁶

The treatment for breast cancer comprises of surgery followed by chemotherapy, radiotherapy, and finally hormonal therapy.⁷ Patient receiving chemotherapy for the treatment of breast cancer have some complications because of the drugs. These complications vary in each patient because of different drugs. The common complications experienced by these patients are tiredness, nausea and vomiting, hair fall which is of short duration, loose stools, reduced blood cells, rash, weight loss or gain, nerve pain, ulcers in mouth, breathing difficulty and soreness in the throat.^{8,9}

Bahall M (2017) studied 350 patients diagnosed with cancer on utilization of Complementary and Alternative Medicine (CAM) and observed that 39.1% were using CAM. Most of the patients (93.6%) were generally satisfied with use of CAM and majority (89.8%) thought it was helpful. Patients perceived that CAM was useful in empowerment, control, cure, and improvement of quality of life.¹⁰

Women with cancer of the breast and other types of cancers undergo various treatment modalities such as surgery, chemotherapy, and radiotherapy. Among these the lengthiest treatment is chemotherapy as it is given after every 21 days in six to eight cycles. While going through cycles of chemotherapy, breast cancer patients experience many side effects such as nausea, vomiting, weakness, anemia, and alopecia. Breast surgeries such as mastectomy which means removal of breast and alopecia i.e. loss of hair cause changes in the body and disturb the body image of women. This leads to psychological stress in women undergoing cancer treatment. These side effects and psychological stress adversely affect coping mechanisms of breast cancer patients and decreased their quality of life.

Recent studies on complementary therapy as yoga, for patients undergoing chemotherapy are emerging

rapidly in cancer treatment. Based on the review of literature the investigator recognized that none of the earlier research actually investigated the effectiveness of yoga on stress level and quality of life of breast cancer patients across all six cycles of chemotherapy. Therefore, the investigator aimed to teach some of the relaxation techniques used in yoga such as: diaphragmatic breathing, systematic relaxation, alternate nostril breathing, & exercises for joints and glands to breast cancer patients undergoing chemotherapeutic drugs and instruct them to practice these. The investigator planned to evaluate its effect on stress level and quality of life throughout six cycles of chemotherapy with the hope that it would decrease their stress level and it would be helpful in sustaining and maintaining their quality of life during chemotherapy.

Research Statement: Study to assess the effectiveness of Yoga on Quality of Life of breast cancer patients undergoing Chemotherapy.

Objectives: The objectives of the study was to determine the effectiveness of yoga on the quality of life of breast cancer patients undergoing chemotherapy.

Hypothesis

H1- There would be significant improvement in the quality-of-life scores of breast cancer patients undergoing chemotherapy, in the experimental group compared to those in the control group after implementation of yoga at $p < 0.05$ level of significance.

Methodology

Research Approach: The quantitative research approach was adopted in this study

Research Design: The Randomized Clinical Controlled study with Time series design was adopted in the present study.

Setting of the study: The present study was done at the Cancer Research Institute, a unit of Himalayan Hospital. The institute addresses to early detection, treatment and research in cancer. It has been providing diagnostic services as well as treatment facilities for all types of cancer such as surgery, chemotherapy, and radiation therapy through its specialty departments such as nuclear medicine, Onco-surgery, day care and in patient chemotherapy, and radiotherapy.

Population: The population of the present study comprised of female patients diagnosed with breast cancer and undergoing treatment in Cancer Research Institute, Swami Rama Himalayan University.

Sample: The sample of the present study were female patients diagnosed with breast cancer and undergoing chemotherapy in Cancer Research Institute, Swami Rama Himalayan University.



Sample size: Total 100 breast cancer patients, who were receiving six cycles of chemotherapy were recruited in the present study.

Sampling Technique- Consecutive sampling technique was adopted in the study to recruit the sample. In that all the breast cancer patients who were coming to Day Care Center for chemotherapy and were fulfilling the inclusion criteria were included in the study. The eligible sample was randomized into control and experimental groups by concealed randomization, by using sealed numbered envelopes. The investigator prepared these envelopes with the help of a colleague. As the study participants were available the investigator opened the sealed numbered envelop in which group name was written and assigned the patient to that group.

Sampling criteria: Following inclusion and exclusion criteria were used to take the sample in the study.

Inclusion Criteria: The following criteria were kept under consideration for selecting the sample. Females breast cancer patients of all age groups who:

1. Had undergone breast surgery as primary treatment and were scheduled for receiving adjuvant chemotherapy.
2. Were agreed to take part in the study.
3. Were not practicing yoga.
4. Could follow instructions related to yoga in Hindi language.
5. Were willing to practice yoga regularly at home.
6. Had Zubrod's performance status score 0-2. This means that they were able to walk about more than fifty percent of the time.

Exclusion Criteria: Breast cancer patients were not included in the study if they -

1. Had any known metastasis.
2. Received chemotherapy before surgery and after radiotherapy

Description of the Tools: In the present study the following tools were used to collect data

1. Socio demographic and clinical Proforma
2. Eastern Cooperative Oncology Group (ECOG, Zubrod) performance scale
3. Hindi Version of European Organization for Research and Treatment of Cancer Quality of Life Tool- EORTC QLQ-BR 23(version 3)

Ethical consideration

Ethical permission was obtained from Ethics committee of Swami Rama Himalayan University. Administrative permission was taken from Director, Cancer Research Institute. Written informed consent was taken from each participant.

Data Collection Procedure/Study Protocol

Sealed envelopes with numbers written on them were prepared for concealed randomization of study participants to control and experimental groups.

All participants who participated in the study were able to move around their own. Their Zubrod's performance status score was between 0—2.

The investigator identified the eligible participants based on the inclusion and exclusion criteria and randomized them into control and experimental groups. The researcher explained the reasons for conducting study and process of the data collection to the patients and their accompanying relatives. Thereafter the investigator explained the consent form to the patients and their relatives. Assurance was given to them that their information would be kept confidential and they could leave the study whenever they wished. They signed consent form to show their willingness to partake in the study.

During the first chemotherapy cycle, the investigator met the participants and handed out the socio-demographic and clinical proforma, QLQ BR 23 questionnaire to study participants in the experimental and the control group. All patients who could read and understand the Hindi language filled the questionnaire by themselves. The investigator assisted those study participants, who could not read Hindi, in filling the questionnaire by reading the questionnaire to them and asking them to tick the option best suited them.

Following that, the investigator explained the benefits of performing yoga during the period of receiving chemotherapy to patients in the experimental group and taught them yoga by demonstrating the steps of diaphragmatic breathing, systematic relaxation, alternate nostril breathing, & neck and shoulder exercises. The return demonstration was done by participants in front of the investigator. The researcher spent two hours with study participants who were in the experimental group during the first cycle of chemotherapy.

The researcher provided each one of them a booklet on "Yoga during chemotherapy" which contained information regarding steps of performing diaphragmatic breathing, systematic relaxation, alternate nostril breathing & joints and glands exercises of neck and shoulder, in words and pictorial form. Participants were asked to practice the above mentioned steps twice daily (morning & evening) at home and to maintain a record of the same.

The investigator met participants of both groups when they came after 21 days for their next second, third, fourth, fifth and sixth cycles of chemotherapy and gave them Hindi versions of QLQ BR23 questionnaire to fill and after that supervised the patients who were in the experimental group in practicing diaphragmatic breathing, systematic relaxation and alternate nostril breathing while they were receiving chemotherapy.



Reminder calls were made to the participants in the experimental group once a week on every Wednesday, being mid-day of the week to remind them about continuation of yoga practice.

The patients in experimental group and control group were assigned beds separately in Day Care Center, to prevent contamination.

Patients in the control group received routine care which included instructions, regarding diet to be taken and care between the cycles of chemotherapy.

Routine Care: Patients in control group were given instructions regarding diet and care after chemotherapy- Drink adequate water in a day i.e. at least eight glasses, take bland diet and avoid spices and chilies in food, adequate vegetables to prevent constipation, do not take raw fruits and vegetables, homemade fruit juice or tetra packed juice, green vegetables, avoid going to crowded places, keep away from people having cold & cough, cover head with scarf

The investigator followed each of the study participants in both groups for four months throughout six cycles of chemotherapy.

Analysis of data

Data was analyzed by using statistical software SPSS (version 20). Categorical data expressed as frequency and percentage. Kolmogorov-Smirnov test was used to

check the normality of data. Quantitative data expressed as mean \pm SD and median (minimum-maximum). Chi-square test /fisher exact test was performed to test the proportion between the groups. Independent "t" test was performed to compare the statistical significance between the groups. Since variables followed skewed distribution therefore two groups were compared by using Mann-Whitney test. Within group effect was estimated by Friedman test. Wilcoxon Signed rank test was used to find the difference from the baseline score. Since it was an experimental study therefore confidence interval was estimated by using independent "t" test as per the CONSORT guidelines. $P < 0.05$ was considered as statistically significant results.

Results

Clinical variables of study participants in the control and the experimental groups were compared for significant differences. Since all data was categorical in nature chi-square/ Fisher's exact tests were performed to find significant differences. The results indicated that patients in both groups had no significant difference. Only one variable i.e. Grade of cancer was significant ($p=0.026$) between the groups. Hence based on the results it could be interpreted that breast cancer patients in both groups were homogeneous in relation to their clinical variables suggesting that patients in both groups were from the same population.

Effectiveness of yoga on Quality Of Life (EORTC BR-23) of breast cancer patients undergoing chemotherapy.

Table 1: Comparison of quality of life (EORTC BR23) between Control group and Experimental of breast cancer patients at the baseline (cycle one)

S. No	Domains Of Quality of Life	Control Group (N=52)		Experimental Group (N=48)		p* value
		Mean \pm SD	Median (minimum-maximum)	Mean \pm SD	Median (minimum-maximum)	
	Functional scales					
1	Body Image	74.67 \pm 6.99	75 (33.33-100)	77.5 \pm 9.87	75 (33.33-100)	0.09
2	Sexual Functioning	0.74 \pm 4.96	0 (0-33.33)	0.42 \pm 8.09	0 (0-33.33)	0.9419
3	Sexual Enjoyment	-	-	-	-	
4	Future Perspectives	50.64 \pm 16.81	66.66 (33.33-66.66)	45.13 \pm 16.11	33.33 (33.33-66.66)	0.098
	Symptom scales					
1	Systemic Therapy Side Effects	4.85 \pm 5.77	4.76 (0 - 28.57)	3.86 \pm 3.20	4.76 (0 - 14.28)	0.771
2	Breast Symptoms	13.78 \pm 9.60	8.33 (8.33-50)	14.75 \pm 7.13	16.66 (8.33-41.66)	0.085
3	Arm Symptoms	30.55 \pm 11.61	33.33 (11.11-66.66)	30.09 \pm 14.12	22.22 (11.11-77.77)	0.495
4	Upset by Hair Loss	-	-	-	-	-

*Wilcoxon rank-sum (Mann-Whitney) test, $p < 0.05$



Table 1 shows that at baseline the patients in the control and the experimental groups were having similar mean scores with no significant differentiation. Functional Scales –body image, the p value for control and experimental group was (0.09), sexual functioning (0.9419), future perspectives (0.098). Symptom Scales- Systemic Therapy Side Effects, the p value for control and experiment group (0.771), Breast symptoms (0.085), Arm symptoms 0.495). Therefore it could be interpreted that both groups were homogenous with regard to their quality of life scores at the baseline i.e. first cycle of chemotherapy, suggesting that the patients in both groups belonged to same population. Therefore any variation in the results could be

interpreted with assurance that it was because of yoga practice.

Comparison of Quality of Life (EORTC BR 23) Functional and Symptom Scales between control group and the experimental group of breast cancer patients undergoing chemotherapy

Functional Scales- A higher score represented that quality of life was better and lower score corresponded poor quality of life.

Symptom Scales — Higher score represented that symptoms were more and quality of life was poor. Lower scores represented that symptoms were less and quality of life was better.

Comparison of Quality of Life (EORTC BR 23) Functional Scales- Body Image, within and between Control group and Experimental group of breast cancer patients undergoing chemotherapy

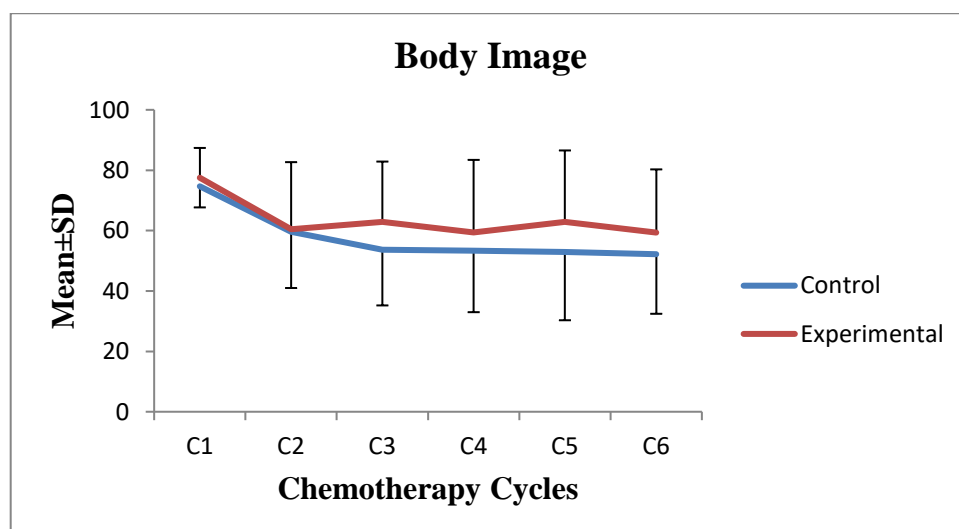


Figure 1: Line graph showing comparison of Mean \pm SD of Body Image scores between control and experiment group

Figure 1: Shows a significant decrease in mean score in the control group from the baseline score in the 2nd, 3rd, 4th, 5th and 6th cycles. In the experimental group also there was significant decrease in mean scores from the baseline in the second, third, fourth, fifth and sixth cycles. The experimental group exhibited statistically

significant differentiation from the control group in the third and fifth cycles (p 0.03, p 0.03). It could be interpreted that yoga was helpful in making improvement in perception of body image in women who were going through chemotherapy in the experimental group.

Table 2: Comparison of Quality of Life (EORTC BR 23) Functional Scales- Sexual Functioning, within and between Control group and Experimental group of breast cancer patients undergoing chemotherapy

Chemotherapy Cycles & No. of patients in Control and Experimental Groups	Functional Scales- Sexual Functioning			
	Control Group Mean \pm SD Median (minimum-maximum)	Experimental Group Mean \pm SD Median (minimum-maximum)	Deference (95% Confi. Internal)	p* Value Mann-Whitney Test
Cycle I (N=100) Control=52 Exp=48	0.74 \pm 4.96 0 (0-33.33)	0.42 \pm 8.09 0(0-33.33)	0.31 (-2.56, 3.18)	0.9419
Cycle II (N=98) Control=51 Exp=47	0.77 \pm 5.08 0(0-33.33)	0.87 \pm 5.40 0(0-33.33)	-0.10 (-2.42, 2.21)	0.9299



Cycle III (N=96) Control=50 Exp=46	1.58±7.18 0 (0-33.33)	2.77±9.34 0 (0-33.33)	-1.19 (-4.92, 2.54)	0.5236
Cycle IV (N=93) Control=47 Exp=46	0	2.70±9.22 0 (0-33.33)	-2.70 (-5.86, 0.45)	
Cycle V (N=84) Control=42 Exp=42	1.56±6.50 0 (0-33.33)	2.85±9.46 0 (0-33.33)	-1.29 (-5.29, 2.70)	0.6894
Cycle VI (N=83) Control=42 Exp=41	0	0		
P value Friedman test				

*p<0.05 **Significant

Table 2 reveals a greater decrease in mean scores of sexual function in the control and the experimental groups. The experimental group exhibited no statistically significant differentiation from the control group in any cycles.

Table 3: Comparison of Quality of Life (EORTC BR 23) Functional Scales- Sexual Enjoyment, within and between Control group and Experimental group of breast cancer patients undergoing chemotherapy

Chemotherapy Cycles & No. of patients in Control and Experimental Groups	Functional Scales- Sexual Enjoyment			
	Control Group Mean±SD Median (minimum-maximum)	Experimental Group Mean±SD Median (minimum-maximum)	Deference (95% Confi. Internal)	p* Value Mann-Whitney Test
Cycle I (N=100) Control=52 Exp=48	0	0±33.33 0(-33.33- 33.33)	0 (-34.39, 34.39)	1.000
Cycle II (N=98) Control=51 Exp=47	11.11±19.24 0(0-33.33)	11.11±19.24 0(0-33.33)	0 (-43.62, 43.62)	1.000
Cycle III (N=96) Control=50 Exp=46	0	8.33±16.66 0(0-33.33)	-8.33 (-25.64, 8.97)	0.263
Cycle IV (N=93) Control=47 Exp=46	0	16.66±19.24 16.66(0-33.33)	-16.66 (-36.65, 3.31)	0.09
Cycle V (N=84) Control=42 Exp=42	0	8.33±16.66 0(0-33.33)	-8.33 (-23.52, 6.85)	0.22
Cycle VI (N=83) Control=42 Exp=41	0	0		
P value Friedman test				

*p<0.05 **Significant #Wilcoxon Signed Rank test (significant)

Table 3 reveals a greater decrease in mean of sexual enjoyment in control and experimental groups. The experimental group exhibited no statistically significant differentiation from the control group in any cycles.

Comparison of Quality of Life (EORTC BR 23) Functional Scales- Future Perspectives, within and between Control group and Experimental group of breast cancer patients undergoing chemotherapy

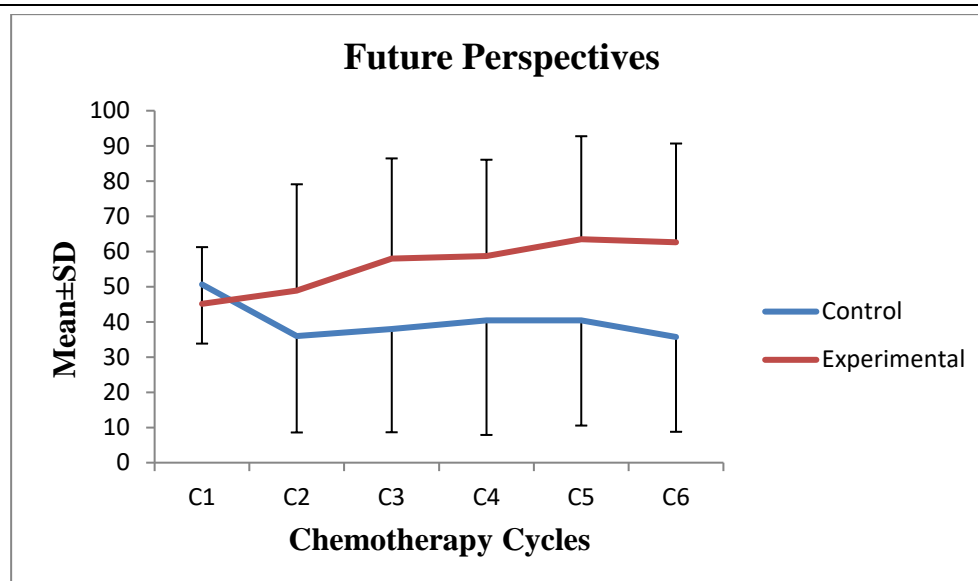


Figure 2: Line graph showing comparison of Mean \pm SD of Future Perspectives scores between control and experiment group

Figure 2: shows in the control group mean scores decreased from the baseline in all through six cycles. It was not statistically significant. In the experimental group mean scores increased significantly from the baseline score in the 2nd, 3rd, 4th, 5th and 6th cycles. The experiment group exhibited a considerable

difference from the control group in 2nd, 3rd, 4th, 5th and 6th cycles (p 0.03, p 0.001, p 0.03, p 0.00, p 0.000, p 0.000). It could be interpreted that yoga was helpful in improving the future perspectives of women who were going through chemotherapy in the experimental group.

Comparison of Quality of Life (EORTC BR 23) Symptom scales- Systemic therapy side effects, within and between Control group and Experimental group of breast cancer patients undergoing chemotherapy

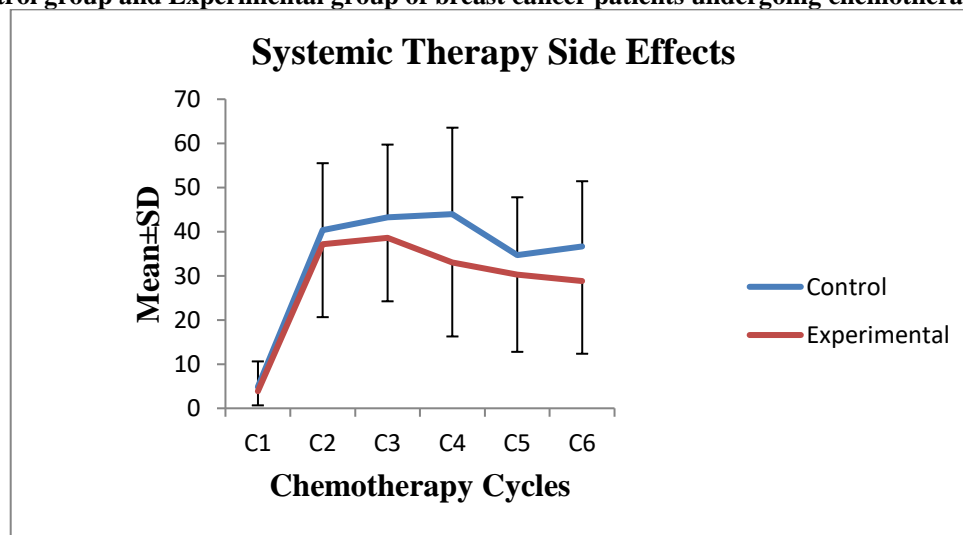


Figure 3: Line graph showing comparison of Mean \pm SD of systemic therapy side effects scores between control and experiment group

Figure 3 reveals that mean scores in the control group increased significantly from the baseline score in 2nd, 3rd, 4th, 5th and 6th cycles. In the experimental group the scores also increased significantly from the baseline in the 2nd, 3rd, 4th, 5th and 6th cycles. Significant

difference amongst experimental group & control group was observed in the 4th and 6th cycles (p 0.008 & p 0.02). It could be interpreted that yoga was effective in reducing the systemic therapy side effects in patients going through chemotherapy in the experiment group.



Comparison of Quality of Life (EORTC BR 23) Symptom Scales- Breast symptoms, within and between Control group and Experimental group of breast cancer patients undergoing chemotherapy

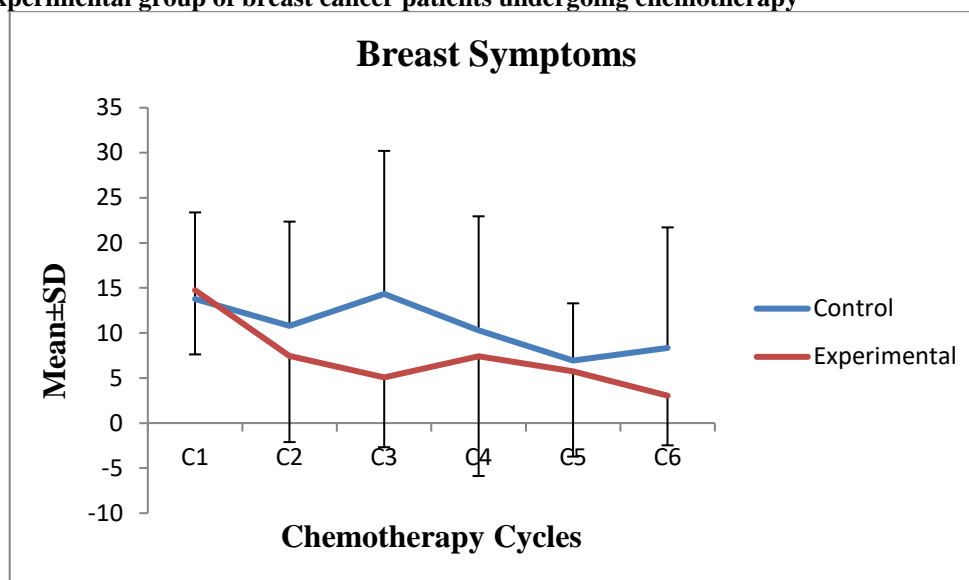


Figure 4: Line graph showing comparison of Mean \pm SD of breast symptoms scores between control and experiment group

Figure 4 shows in the control group breast symptoms mean scores decreased significantly from the baseline in 2nd, 5th and the 6th cycles. It was not statistically significant. However, in the experimental group the scores decreased significantly from the baseline in the 2nd, 3rd, 4th, 5th and 6th cycles. Significant difference

between experimental group and control group was observed during 3rd and 6th cycles (p 0.0001, p 0.01). It could be interpreted that yoga was helpful in decreasing breast symptoms in women who were going through chemotherapy in the experimental group.

Comparison of Quality of Life (EORTC BR 23) Symptom Scales- Arm Symptoms, within and between Control group and Experimental group of breast cancer patients undergoing chemotherapy

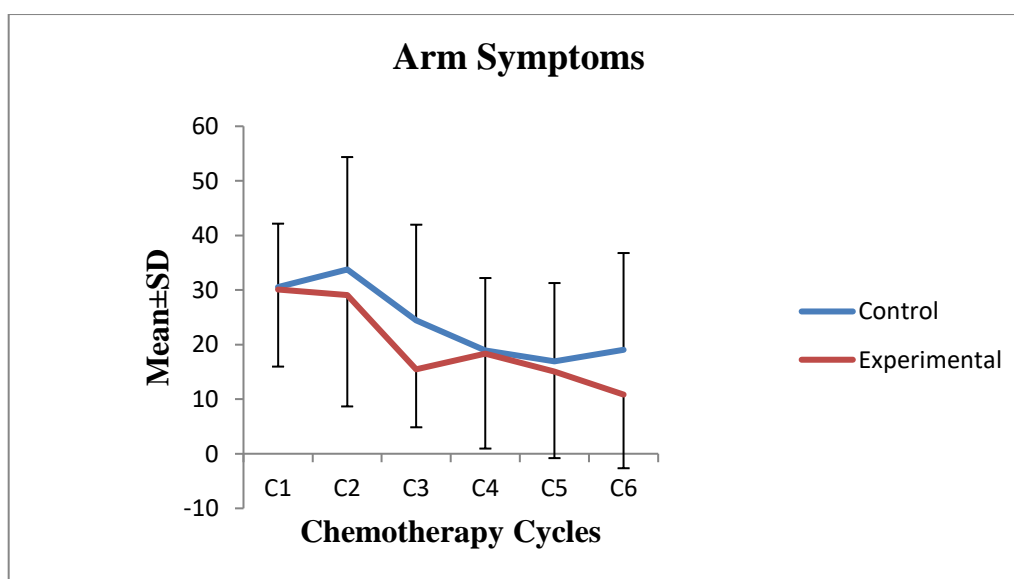


Figure 5: Line graph showing comparison of Mean \pm SD of arm symptoms scores between control and experiment group



Figure 5 shows in the control group the mean arm symptoms decreased significantly from the baseline in the 3rd, 4th, 5th and 6th cycles. In the experimental group also significant decrease in scores occurred from the baseline score in the 3rd, 4th, 5th and 6th cycles. Significant dissimilarity amid experimental and control

groups was observed in the third & sixth cycles (p 0.003, p 0.01). It could be interpreted that yoga was helpful in decreasing the symptoms of arm in women who were receiving chemotherapeutic drugs in the experimental group.

Comparison of Quality of Life (EORTC BR 23) scores of Symptom Scales- Upset by hair loss, within and between Control group and Experimental group of breast cancer patients undergoing chemotherapy

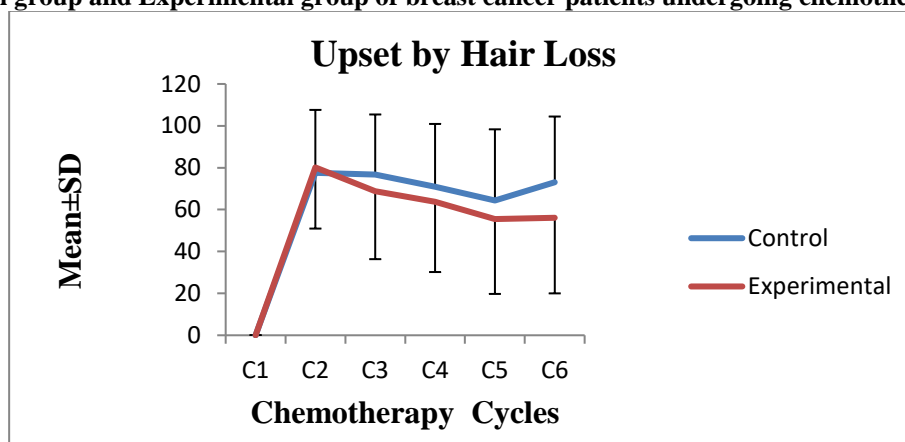


Figure 6: Line graph showing comparison of Mean \pm SD of upset by hair loss scores between control and experiment group

Figure 6 depicts in the control group mean scores increased significantly from the baseline (second cycle) in the 3rd, 4th, 5th and 6th cycles. In the experimental group also the scores increased from the baseline score in the 3rd, 4th, 5th and 6th cycles. The experiment group exhibited a considerable dissimilarity from the control group in the sixth cycle only (p 0.02). It could be interpreted that yoga was effective in reducing the emotional disturbance caused by hair loss in breast cancer patients who were going through chemotherapy in the experimental group.

Hence on the basis of results it could be inferred that improvement in quality of life i.e. the functional & symptom scales in the experiment group compared to the control group was because of yoga intervention.

Therefore researcher rejected the null hypothesis and partially accepted the alternate hypothesis stating that there would be a significant improvement in the quality of life scores of breast cancer patients going through chemotherapy, in the experimental group compared to those in the control group after implementation of Yoga.

Discussion

Effectiveness of yoga on Quality Of Life (EORTC BR-23) of breast cancer patients undergoing chemotherapy

Functional Scales- Results of the present study revealed a trend of decrease in the mean scores of patients' positive perception of their body image. A significant decrease in mean scores was observed in the experimental as well as the control group from the baseline score in the second through the sixth cycle. The results revealed women with breast cancer experienced changes in positive perception of their body image during the period of chemotherapy. This might be due to alopecia and breast surgery. Significant differentiation in the scores of both groups was observed in the third and fifth cycles (p 0.03, p 0.03). The results revealed that yoga was useful in improving the perception of body image of breast cancer patients going through chemotherapy in the experimental group in comparison to the control group.

Results are supported by research done by Moqimi M et al. (2013). The participants in the experiment group showed improvement in positive perception of their body image after the yoga practice, whereas the control group had no improvement. Both groups had no significant variations in sexual well-being before and after the yoga.¹¹

Sexual Function & Sexual Enjoyment- The results showed a greater decrease in the mean scores of sexual function & sexual enjoyments in the control and the experimental group reflecting diminished sexual functioning. Results were consistent with Gokgoz S. et al. (2011). They reported sexual functioning scale had



the lowest score, reflecting diminished sexual functioning.¹²

Future Perspective –The results revealed that in the control group, mean scores decreased from the baseline scores in the second through the sixth cycle. It was not significant statistically. But in the experimental group the mean scores increased significantly from the baseline score in the second till sixth cycle. Significant differentiation in the average scores of both groups was observed in the second through the sixth cycle of chemotherapy (p 0.03, p0.001, p0.03, p0.00, p0.000,p 0.000). It revealed that yoga was helpful in making improvement in future perspectives women with breast cancer who were undergoing chemotherapy and belonged to experimental group compared to the control group.

Symptom Scales –

Systemic therapy side effect- Results revealed that as the chemotherapy cycles progressed there was an increase in mean scores. The scores of the experimental and the control group increased significantly from the baseline score in the second through the sixth cycle. A statistically significant differentiation among scores of the experimental group and the control group was observed in the fourth and sixth cycles (p 0.008& p0.02). It revealed that yoga was effective in reducing side effects in breast cancer patients undergoing chemotherapy belonging to the experimental group as compared to the control group.

The same results were reported by Siedentopf F. et al. (2013) in Germany. They observed that side effects of chemotherapy and symptoms related to breast and arm and distress due to alopecia became less over time.¹³

Breast symptoms- Results showed a significant decrease in breast symptoms mean scores of the control group from the baseline score during the second, fifth and sixth cycles. In the experimental group the scores decreased significantly from the baseline score in the 2nd, 3rd, 4th, 5th and 6th cycles. Statistically significant differentiation in the scores of both groups was observed in the third and sixth cycles (p 0.0001, p 0.01). It could be interpreted that yoga was effective in reducing the breast symptoms in women with breast cancer who were undergoing chemotherapy in the experimental group in contrast to the control group.

The arm symptom – results revealed that mean arm symptoms scores in the experimental and control group decreased significantly from the baseline score in the third through the sixth cycle. Statistically significant differentiation among scores of both groups was observed in the third and the sixth cycles (p 0.003, p 0.01). It could be interpreted that yoga was effective in reducing the breast symptoms in patients undergoing chemotherapy and belonged to the experimental group, when compared to the control group.

Results of the present study were supported by Andysz A. et al. (2014) as they reported that the experimental group showed borderline significance (p = 0.059) in arm and breast symptoms and fatigue. The experimental group had a significant increase in general health and quality of life and also reported a significant reduction in signs of arm after the yoga intervention.¹⁴

Upset by hair loss- The results revealed that breast cancer patients were upset because of hair loss, a side effect of chemotherapy. In the experimental as well as the control group the scores increased significantly from the second cycle (baseline) score in the third till sixth cycle. Statistically significant differentiation in the scores of both groups was observed only in the sixth cycle (p 0.02). It could be interpreted that yoga was effective in reducing the distress caused by hair loss among breast cancer patients who were receiving chemotherapy and belonged to the experimental group. The results revealed that patients in the experimental group had a decline in the symptoms of side effects of chemotherapy, breast and arm symptoms and distress caused by alopecia because of yoga intervention, in comparison to the control group.

Results were supported by Lôbo SA et al. (2014) who researched quality of life related to health in breast carcinoma patients going through chemotherapy. They reported that many women had side effects of chemotherapy. Commonly reported symptoms were hair loss, arm symptoms and breast symptoms.¹⁵

On the contrary results of this study were differed from a study done by Chui PL et al. (2015) who researched quality of life related to health in breast carcinoma patients who were going through chemotherapy, and compared two groups- one using Complementary and Alternative Medicine (CAM) and the other not using CAM. They observed that there was no significant differentiation in the scores of overall health condition and physical, emotional, role, cognitive and social functions between the two groups. Patients who used CAM had greater financial difficulties, more side effects from the chemotherapy and more breast symptoms in comparison to those who did not use CAM. ¹⁶

Analysis revealed that a significant difference in quality of life scores of the control and the experimental group were exhibited mainly in the third & fourth cycles onwards. This revealed that as patients continued practicing yoga, their quality of life improved. Therefore, based on the results of this study, it can be interpreted that the yoga intervention consisting of relaxation techniques i.e. diaphragmatic breathing, systematic relaxation, alternate nostril breathing and joints & glands exercise of neck and shoulder; was effective in enhancing the quality of life of breast cancer patients going through adjuvant



chemotherapy. It also reduced the symptoms of depression and helped in maintaining a lower levels of anxiety and stress, which breast cancer patients experienced while going through the chemotherapy regimen.

Limitations of the study: Assessment of the effectiveness of yoga on quality of life of breast cancer patients receiving chemotherapy regimen was a challenging task. The patients' acceptance of yoga was very high. The study has the following limitations;

1. Yoga practiced by patients at home could not be monitored.
2. The control group could not be taught yoga because of the nature of the study.

Implications of the Study: The present study has several implications for clinical practice

1. It has been revealed by the present study that adverse effects of chemotherapy are detrimental to the quality of life of women with breast cancer during the period of chemotherapy.
2. The study also demonstrated that yoga was effective in reducing the adverse effects of chemotherapy and improving the quality of life of women with breast cancer.

Recommendations from the present research findings: The findings of this research bring forward the following recommendations-

1. Relaxation techniques included in the present study can be taught & practiced by patients undergoing surgery, chemotherapy and radiation therapy, under the supervision of nurses and yoga teachers.
2. Focus Group Discussions among breast cancer patients receiving treatment and survivors should be organized to motivate patients to complete their treatment
3. Regular yoga classes should be organized for patients undergoing cancer treatment.

Recommendations for Further/Future Research: Based on the findings of this study the investigator suggested the following recommendations for future research-

1. Research can be undertaken on effectiveness of relaxation techniques on quality of life of cancer patients undergoing radiation therapy.
2. Qualitative study can be done on experiences of breast cancer patients undergoing chemotherapy
3. Descriptive study can be done to assess coping strategies adopted by cancer patients undergoing chemotherapy.

Conclusion: Findings of this research highlighted that yoga intervention was effective in breast cancer patients who were going through chemotherapy in-

1. Improving the quality of life of breast cancer patients in experimental group with respect to the perception of body image and future perspectives.
2. Decreasing the adverse effect symptoms of chemotherapy and arm & breast symptoms. It was also effective in reducing the distress caused by alopecia, i.e. hair loss, during the period of chemotherapy.

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