CHAPTER V

DISCUSSION

This research was done in the Cancer Research Institute, Swami Rama Himalayan University, swami Ram Nagar, Dehradun. Data was collected prospectively over a period of two years. A total of 100 female patients diagnosed with breast cancer were incorporated in the study. All the breast cancer patients were women and were undergoing six cycles of chemotherapy. They were randomized to experimental and control groups by concealed randomization. Yoga, consisting of diaphragmatic breathing, systematic relaxation, alternate nostril breathing and joints and gland exercise of neck and shoulder was taught to patients in the experimental group, and they were asked to practice it twice in a day-morning and evening. The stress level and quality of life were measured during the six cycles of chemotherapy. Stress level was assessed by the Anxiety Depression Stress Scale. Quality of life was assessed by the European Organization for Research and Treatment of Cancer Quality of Life Tool-EORTC QLQ-C30 (version 3) and EORTC BR-23.

The results of the study are discussed under the following headings:

1. Sociodemographic variables of breast cancer patients
2. Clinical variables of breast cancer patients undergoing chemotherapy
3. The effectiveness of yoga on Anxiety, Depression and Stress of breast cancer patients receiving chemotherapy
4. The effectiveness of yoga on the quality of life of breast cancer patients receiving chemotherapy

1. Socio-demographic variables of breast cancer patients

Out of 100 breast cancer patients (Control n=52; Experiment n=48), most of the patients (42.31%) in the control group belonged to the age group between 46-60 years and in the experimental group (45.83%) were ≤ 45 years. The average age of the control group participants was 50.730±11.73 and the experimental group's 48.66±9.69. This finding is similar to Chen S F et al. (2015) who reported the average age of sample in the control group was 52.3 years and the experimental group 49.3 years. Similarly Dhruva A. et.al (2012) reported the mean age of participants in the control and the treatment group was 56.0± 11.9 & 52.4± 14.6 respectively. Saleha SB et al. (2012) reported the average age of subject was 46.3± 9.52 years. So the age group of breast cancer patients reported in the present study is similar to age groups of other studies.

In the present study 34.61% female patients in the control group and 22.91% in the experimental group did not have formal education. But 17.31 % in the control group and 25% in the experimental group were graduates. In contrast Srivastava V et. al (2016) observed most (63.50%) of the females with breast cancer in their study were illiterate or had only a primary school basic education. Saleha SB et al. (2012) reported 72% were illiterate. The study done by Valenti M et.al (2008) reported 41.0% had completed high school and 11.0% university.

The majority of the patients in this study were homemakers, 92.31% in the control and 83.33% in experimental groups respectively. Similarly Saleha SB et al. (2012) in their study reported that the majority (94%) of the patients were housekeepers.

A maximum number of the patients in this study were married, 86.53% in the control and 91.66% in the experimental group. This was similar to Valenti M et.al (2008) who reported, 90.0% of the study sample in their study were married. Srivastava V et. al (2016) reported majority of the sample were married (79.50%).

In the present study a majority (76.92%) of the patients who were in the control group and 81.25% of experimental group were living with their husband and children. Loh SY et al. (2009) reported that most (68%) of the study subjects were residing with their husbands and children.

In the present study among the sample, a majority did not have any co morbidity, 71.15% in the control and 70.83% in the experimental group. But 28.85% in the control and 29.17% in the experimental group had co-morbidity. Another study done by Sharma N. et al. (2016) reported the prevalence of co morbidities among breast cancer was hypertension (21.8%), COPD (19.9%), rheumatoid arthritis (18.6%), diabetes mellitus (16.7%). This difference in findings may be attributed to the age of the patients and risk factors which could not be modified.

In the present study, the majority (84.62%) of the patients belonging to control and 66.67% of the experimental group did not have a history of cancer in the family. Only 15.38% in control and 33.33% in experiment group had a history of cancer in their families. Similar findings were reported by Akin S et al. (2008) 12.1% (n ¼ 17) of the breast cancer patients in their study had a close family member with a diagnosis of cancer, 21.3% reported a family history of a malignant disease other than breast cancer.

The results revealed that less than half of the participants 34.62% of the control group and half 52.08 % of the experimental group heard about breast cancer. 65.38% patients of the control and 47.92% of the experimental group had not heard about breast cancer. A qualitative study conducted by Karbani G. et al. (2011) reported that most South Asian females did not have knowledge regarding cancer and its clinical manifestation. In contrast a study done by Mudduwa L. & Wijesinghe C. (2009) on awareness regarding breast cancer among females with breast diseases revealed that out of 126 patients incorporated in the research, 111 (88%) had heard or read about breast cancer.

2. Clinical variables of breast cancer patients undergoing chemotherapy

In the present study the majority of the patients (65.38%) in the control group and half 52. 08% in the experimental group were premenopausal and one third 34.62% in the control and 47.92 % in the experimental group were post menopausal. Similarly Rao RM et.al (2009) from Bangalore reported that 61 % of patients of the yoga group and 39 % of the control group were premenopausal and 33 % in the yoga and 61 % in the control group were post menopausal. Suresh P. (2013) reported 52% of the sample was premenopausal and 48% post menopausal. Similarly Aghabarari M et al. (2008) reported maximum 64.3% in the control and 46.4 % in the experimental group were in premenopausal state. Similarly Junghaenel D.U. et al. (2015) from

Los Angeles California, reported that 42.9 % of females with breast carcinoma were post menopausal.

In the present study it was found that a majority of the participants 98.08% of the control and 93.75% of the experimental group, had a medical diagnosis of Infiltrating Ductal Carcinoma and a majority of them 76.92% of the control and 85.42% of the experimental group had Grade II cancer. Whereas Vadiraja HS et al. (2009) from Bangalore reported 84.1% in the yoga and 39.7% in the control groups were diagnosed with Infiltrating Ductal Carcinoma. Similarly Rao RM et.al (2009) from Bangalore, in their study reported 54 % of control and 46 % of experimental group were diagnosed with Infiltrating Ductal Carcinoma. On the other hand Gokgoz S. et al. (2011) from Turkey reported half of the patients in their study were diagnosed with Invasive Ductal Carcinoma and only 3.3% Invasive Lobular Carcinoma.

In the present study the majority (94.23%) in the control group and 97.92% in the experimental group had had breast cancer for less than one year. This revealed that the majority of the females with breast cancer reported changes in the breast early. In contrast Danhauer SC et al**.** **(**2009) from the USA reported a mean time since diagnosis of breast cancer was 24.4 months yoga group and 22.8 months control group.

In the present study the majority (94.23%) in the control and 93.75% in experimental groups had undergone breast surgery in the form of Modified Radical Mastectomy. Similar findings were reported by Suresh P. (2013) from North India. The majority of the breast cancer patients (75.8%) had undergone Modified Radical Mastectomy (MRM), Invasive Ductal carcinoma was the predominant histology (127 patients). Another study done by Montazeri A et.al (2008) reported a majority (82.6%) of the cases underwent mastectomy. Aghabarari M et al. (2008) reported a majority 92.9 % belonging to the control and 89.3 % of the experimental group had undergone Modified Radical Mastectomy.

3. The effectiveness of yoga on Anxiety, Depression and Stress of breast cancer patients undergoing chemotherapy

Based on the literature search the investigator had recognized that none of the previous studies actually looked at the results of yoga across all six cycles of chemotherapy. This was the first

randomized clinical control trial in which the effectiveness of yoga on the stress level of breast cancer patients undergoing six cycles of chemotherapeutic agents was assessed.

Anxiety, Depression and Stress scale

In the present study results related to the anxiety subscale revealed that breast cancer patients of the control and the experimental groups experienced symptoms of lower level anxiety during the first cycle (baseline) of chemotherapy. This might be because adequate information given by the physicians to patients regarding side effects of chemotherapy. The level of anxiety increased in the control group in the second & third cycles then decreased in the fourth & fifth cycles and again increased in the sixth cycle. However, in the experimental group the level of anxiety remained similar to the baseline score in the 2^{nd}, 3^{rd}, 4^{th}, 5^{th} and 6^{th} cycles. The experimental group exhibited a statistically significant difference in anxiety scores in comparison to the control group in the 2^{nd}, 3rd and 6^{th} cycles (p 0.01, p 0.02, p 0.02). It showed that yoga was effective in maintaining a lower level of anxiety in breast cancer patients belonging to experiment group compared to the control group while undergoing chemotherapy.

With regard to the depression subscale, patients in both groups experienced similar levels of depression symptoms. As cycles of chemotherapy progressed, the depression score (4.82± 2.28) of patients in the control group mean remained almost the same all through the second to sixth cycle. However, in the experimental group the depression scores significantly decreased in the second through the sixth cycle from the baseline score. Statistically significant difference existed between experimental and control groups in second till sixth cycles of chemotherapy (p0.02, p 0.02, p 0.02, p0.001, p0.000) respectively. It revealed that yoga was effective in decreasing symptoms of depression in patients who were in the experimental group.

In the stress subscale, the mean stress score in the control group increased statistically in cycles three and four from the baseline score. In the experimental group the scores differed statistically from the baseline score in the second, third and fifth cycles. A statistically significant difference was exhibited between the experimental and control groups in the third cycle (p 0.01). It showed that yoga was effective in maintaining symptoms of a lower level stress in breast malignancy patients going through chemotherapy in the experimental group.

Results were supported by studies done to assess the effectiveness of yoga in the form of relaxation techniques, such as breathing exercises and muscle relaxation, on anxiety, depression and stress among cancer patients. Anxiety, depression and stress were assessed by using various questionnaires.

Results were consistent with Pandey M et al (2006) who assessed psychological disturbances such as distress, anxiety and depression levels in cancer patients getting chemotherapy. Results revealed that cancer patients undergoing chemotherapy exhibited a mild to moderate level of anxiety and depression.

Results were further similar to Vadiraja H. S. et al (2009). Their study findings revealed a significant reduction in anxiety, depression, & perceived stress in the yoga group in comparison to the control group.

Results were supported by Dhruva A et al. (2012) who reported that the intervention group showed a continuing decrease in stress, sleep interruption, anxiety and increase in mental quality of life in the middle and ending point of research.

Sudarshan M. (2013) in his study, observed a consistent trend in the decrease of the anxiety and depression scores of breast cancer patients in the yoga group than the control group, although without statistical significance.

Results of the present study were supported by Kashani F. et al.(2012). They observed a significant decrease in the depression, anxiety and stress average scores after implementation of yoga in the yoga group ($p < 0.05$) than the control group.

Similarly, research done by Charalambous A., et al. (2015) observed a significant difference in the anxiety and depression scores of the intervention group who underwent guided imagery and relaxation, in comparison to the control group.

In addition research by Yilmaz SG & Arslan S. (2015) observed that sample in the experiment group had statistically significant ($p<0.05$) difference in the post test average scores in comparison to the control group.

Results were further supported by a study done by Bannerjee BN.et al (2007). Their findings revealed that the anxiety and depression scores reduced significantly in the yoga group, but the

patients in the control group exhibited elevated levels of psychological disturbances. The mean stress score decreased in the yoga group, while no variation was reported by control group before and after radiotherapy.

The results of the present study were further supported by Chen SF et al. (2015) from Taiwan. Their results revealed a significant difference in physical symptoms such as insomnia and numbness ($P < 0.05$) and psychological distress such as anxiety ($P < 0.00$) and depression ($P < 0.00$) in the intervention group compared to the control group.

Results were supported by Kashani F et al. (2012). Their results revealed that the experimental group displayed a significant improvement in post intervention mean scores of depression, anxiety & stress than that of pre intervention scores. On the contrary the control group had no significant differentiation .

Similar results were found by Song Q et al. (2013). Their results revealed that subsequent to chemotherapy the scores of anxiety and side effects of chemotherapy increased significantly in control group, while these remained same as baseline scores. After chemotherapy psychological health & physical health scores of patients in experimental group reduced significantly than control group.

Results were consistent with the randomized controlled trial by Rao MR et al. (2009). The finding of their study revealed that the yoga group had declining anxiety scores i.e. state and trait than control group.

Bower et al.(2012) studied the efficacy of yoga on the constant tiredness in women who survived after treatment for breast cancer. Their results revealed that patients in both the groups had optimistic improvements in symptoms of depression and perceived stress.

In contrary these results were not supported by the randomized controlled trial done by Taso CJ et al. (2014). Their results revealed that the yoga exercise program did not improve the levels of depression or anxiety significantly in breast malignancy clients receiving chemotherapeutic drugs.

4. The effectiveness of Yoga on quality of life of breast cancer patients undergoing chemotherapy

Based on the literature search, the investigator recognized that none of the previous studies had actually looked at the results of yoga across all six cycles of chemotherapy. This research study is the first one, in which the effectiveness of yoga on the quality of life of breast cancer patients undergoing six cycles of chemotherapeutic agents was assessed.

Quality of life EORTC QLQ-C30 questionnaire

The data analysis revealed a consistent trend of decline in the global health status mean scores from the baseline mean in second through the fifth cycles in control group. However, there was a slight increase in the scores in the sixth cycle. The global health status mean scores also decreased significantly in the experimental group in the second and third cycles; but then there was a gradual increase in the fourth, fifth and six cycles. The experimental group exhibited statistically significant differentiation in comparison to the control group in cycles two, three, four, five and six (p 0.03, p 0.03, p 0.003, p 0.000, p 0.001 respectively). The results revealed that as patients in the experimental group continued practicing yoga, their global health status improved during the period of chemotherapy. However the control group had no such improvement.

Findings were supported by Andysz A. et al. (2014). Their results revealed that the experimental group who practiced yoga, displayed a significant increase ($p = 0.048$) in general health status and quality of life scores in comparison to the control group.

Findings were consistent with Shahriari M et al.(2017). They reported a significant increase in the mean scores of overall quality of life in the experimental group after intervention, in comparison to the control group.

Similar results were reported by Yazdani F (2014). Their results revealed that the yoga group had a significant increase in mean global health status scores after intervention.

Similar findings were observed by Culos-Reed S. N et al. (2006) who observed that after intervention, the yoga group had a significant differentiation in overall quality of life, emotional wellbeing and the physical symptom of diarrhea in comparison to the control group ($p<0.05$).

Functional Scales –

Physical function-Results revealed that physical function average scores of the control group decreased significantly from the baseline score in the 2nd, 3rd, 4th, 5th and the 6th cycles, showing a declining trend in scores. However, the average scores of the experimental group reduced significantly from the baseline score in the fourth cycle. Significant differentiation between experimental and control group was observed in the third, fifth and sixth cycles (p 0.007, p 0.0002, p 0.0007). It revealed yoga was helpful in causing improvement in the physical functioning of patients with breast cancer who were undergoing chemotherapy in the experimental group in comparison to the control group.

Role Function- A pattern of gradual decrease in means scores of role function was found in the control group from the baseline score (66.98± 14.19) in the second through the sixth (51.58±20.76) cycle of chemotherapy. However, the experimental group's mean scores were similar to the baseline mean throughout all the six cycles. A statistically significant difference between the experimental group and the control group was observed in the second, third, fourth, fifth and sixth cycles of chemotherapy (p 0.01, p 0.03, p 0.003, p 0.0001, 0.0003) respectively. It revealed that yoga was effective in causing improvement in the role function of patients having breast cancer, receiving chemotherapy in the experimental group in comparison to the control group.

Emotional Function- In the control group a trend of decreasing mean scores of emotional function was found from the baseline score (58. 81±16.11) in the second through the sixth (44. 84±25.36) cycle of chemotherapy. The experimental group also had a decrease in mean scores from the baseline score (60.41±12.69) all through the second, third and fourth (50.36±10.53) cycles. A slight increase was observed in the fifth and sixth cycles of chemotherapy. The decrease in the emotional function scores was greater in the control group compared to the experimental group. Significant differentiation between the experimental and the control group was observed in the sixth cycle (p 0 .05). The results revealed that yoga was useful in improving

the emotional functioning of women with breast cancer who were in the experimental group in comparison to those in the control group while receiving chemotherapy.

Cognitive function- The control group showed a gradual decrease in mean scores of the cognitive function from the baseline score (93.26±13.30) in the second through the sixth (62. 69±30.97) cycle, which was statistically significant. The experimental group also showed a decrease in scores from the baseline (92.01±11.90) in the second through the sixth (75.20±23.31) cycle. A statistically significant differentiation between the experimental group and the control group was observed in fifth cycle (p 0.03). The results showed that yoga was effective in improving the cognitive function of breast cancer patients undergoing chemotherapy in the experimental group. Whereas control group had no such improvement.

Social function- Patients in control group displayed a trend of decreasing mean scores of the social function from the baseline score (58. 33±16.99) in the second through the sixth (37.69±20.51) cycle of chemotherapy, which was statistically significant. Experiment group also showed a decrease in the mean score from the baseline (59.02±14. 56) in second through the fourth (41.30±10.38) cycle. There was a little increase in the fifth and sixth (44.30±12.69) cycles. No statistically significant distinction between the experimental and the control group was observed in any of the cycles. This revealed that the social functioning of breast cancer patients decreased over the time period of chemotherapy due to the side effects of chemotherapy, mainly because of alopecia.

The results of this study were similar to Andysz A. et al. (2014). In their study the components of quality of life such as: global health status, physical functioning, social functioning, role functioning and future perspective improved significantly in experimental group in comparison to the control group. They also displayed lesser indications of difficulty in breathing, tiredness and arm and breast symptoms compared to the participants in the control group.

Similar results were reported by Chandwani KD et al. (2010). Their results revealed that the yoga group had significantly improved scores of understanding about general health and physical functioning (p = .04) in comparison to the control group, seven days after radiotherapy.

Results were further supported by Vadiraja HS et al. (2009). They reported a significant enhancement in emotional and cognitive functions in the yoga group after intervention. However no significant change was reported in social and role functions in either group following intervention.

Another study by León-Pizarro et al. (2007) found that relaxation enhanced the quality of life in breast carcinoma clients who were going through chemotherapy. Results from the study conducted by Shahriari M et al. (2017) revealed that mean scores of overall quality of life were significantly higher immediately after intervention, compared to before ($P< 0.001$) and one and a half months after, compared to immediately after intervention ($P< 0.001$).

Results were consistent with a clinical trial done in Germany by Siedentopf F. et al. (2013). Their findings exhibited that the yoga group had a significantly higher overall quality of life and functional status in comparison to the control group. The physical signs of illness reduced as time went by in both groups. Yoga was helpful in enhancing the physical activeness of patients in the intervention group in comparison to the participants in the control group ($p<0.05$).

The results of the present study were supported by a clinical trial done by Yazdani F (2014). Their results revealed that the experimental group exhibited an increase in all domains of functional scales. However the control group had no such increase. The experimental group also had a significant change in the cognitive performance scale ($p=0.033$).

Results were consistent with Danhauer SC et al. (2009). The participants in the yoga group had a significant with-in group improvement in tiredness. However, the control group did not show improvement.

Similarly Shayan A (2016) from Hamdan Iran reported that stress management treatment enhanced the domains of quality of life such as physical and social functioning, emotional health and overall quality of life.

Symptom scale-

Fatigue- The outcome revealed that patients in the control group had a greater increase in fatigue mean scores from the baseline score in the second through the sixth cycle, which was statistically significant. In the experimental group also, the fatigue scores increased significantly from the baseline score in the second through the sixth cycle of chemotherapy. A statistically significant difference between both group was noted in the second through the sixth cycles (p

0.001, p 0.002, p 0.001,p 0.0002, p 0.0000) respectively. This revealed that breast cancer patients felt fatigued while undergoing chemotherapy and this increased over a period of time. Yoga was effective in relieving the fatigue of patients who were in the experimental group in comparison to the control group.

Results were supported by a study done by Bower et al. (2012). Their findings revealed that the yoga group showed a significant decline in tiredness severity in follow up after three months in comparison to control group. A significant improvement in vigor was observed in the yoga group compared to the control group.

Results were consistent with a clinical trial done by Chakrabarty J et al. (2015). Their results revealed that participants in both groups exhibited a significant differentiation in scores of tiredness caused by cancer. The experimental group who practiced breathing technique, called pranayama, felt less tiredness in comparison to the control group.

The findings of the study were further supported by Pathak P et al. (2013). Their results revealed a significant ($p<0.01$) reduction in pre to post cancer related fatigue in the progressive muscle relaxation group while fatigue increased significantly ($p<0.01$) in the control group.

Taso CJ. et al.(2014). Their results revealed that yoga intervention significantly lowered the total tiredness scores and the intrusion of tiredness in daily life for participants who belonged to the experimental group compared to control group.

Nausea and Vomiting – The results showed that the mean score of nausea and vomiting in the experimental and the control group increased significantly from the baseline score in the second through the sixth cycle. The experimental group exhibited a statistically significant differentiation in comparison to the control group in cycle three (p 0.02). As reported by participants, nausea and vomiting was more prevalent, two to three days right after receiving chemotherapy. Since the data was collected in the third week after chemotherapy, patients reported reduced symptoms of nausea and vomiting.

Results of the present study were supported by a randomized control trial done in Hong Kong by Molassiotis A et al. (2002). Their results revealed that relaxation of body muscles training reduced the interval of nausea and vomiting in patients who belonged to the experimental group

in comparison to the control group. A trend of decline in symptoms of nausea and vomiting was observed.

Similar results were observed by Yazdani F (2014). The control group reported a significant increase in tiredness, feelings of nausea and vomiting, lack of sleep, and other side effects of treatment. However significant decline in all of these symptoms were reported by the experimental group.

Pain- Patients in both groups had breast surgery before chemotherapy. Therefore they reported having pain at the baseline with a mean score 25.32 ±14.19 in the control group and 22.91±14.83 in the experimental group. The pain scores increased significantly from the baseline score in the second, fifth and the sixth cycles in the control group. However in the experimental group scores increased significantly in the fourth cycle only from the baseline score. The pain level increased in both groups especially in muscles due to the side effects of chemotherapy. The difference between the pain scores of both groups was not significant during any of the cycles. The results revealed that yoga did not reduce the pain level of breast cancer patients who were in the experimental group.

Dyspnea-Results revealed that at baseline the dyspnea mean score was minimum 4.48± 11.48 in both the groups. The dyspnea score increased significantly in both groups during the second cycle. This might have been due to the decrease in hemoglobin level as a result of chemotherapy. In the control group the dyspnea score decreased in the third cycle, increased in the fourth, and then decreased in the fifth cycle of chemotherapy. However in the experimental group the score decreased gradually from the third through the sixth cycles. The dyspnea scores of both groups did not differ significantly in any cycles.

Insomnia-The results revealed that in the experimental and control group the mean insomnia scores increased significantly from the baseline score in the second through the sixth cycle. A statistically significant differentiation between the both groups was observed in fifth cycle (p 0.01). The results revealed that yoga was effective in lowering the insomnia of breast cancer patients going through chemotherapy in the experimental group.

Results were consistent with a study done by Dhruva A et al. (2012). Their results revealed improvement in symptom and quality of life scores such as sleep disturbance, ($p < 0.05$) in the experimental group who practiced breathing technique in comparison to control group.

Results were supported by a clinical trial done by Mustian KM et al. (2013). The yoga group exhibited more improvement in total sleep quality and other qualities of sleep in post test in comparison to control group.

Loss of Appetite- Results showed that mean loss of appetite scores of experimental and control group increased significantly from the baseline mean in the second through the sixth cycle. A statistically significant differentiation between mean scores of both groups was observed in the second, fourth, fifth & sixth cycles (p 0.01, p0.006, p 0.01, p0.001). The results exhibited that yoga was useful in improving the appetite in women with breast cancer who were receiving chemotherapy in the experimental group in comparison to the control group.

Results were consistent with a randomized trial done by Vadiraja SH et al.(2009). They observed that the yoga group had a significant decline in fatigue and insomnia. The control group demonstrated a significantly higher loss of appetite. The yoga group had a significant decline in pain and vomiting scores after intervention.

Constipation-the results revealed that patients in both groups reported that they had constipation. The mean scores of constipation of experimental and control group increased significantly from the baseline score in the second through the sixth cycle. The results revealed that patients experienced constipation throughout the period of chemotherapy. A statistically significant differentiation in the scores of both groups was observed in the third cycle (p 0.03). It revealed that yoga was helpful in relieving the symptoms of constipation in breast cancer patients who were going through chemotherapy in the experimental group compared to the control group.

Diarrhea-In the control group the mean diarrhea score increased significantly from the baseline in the sixth cycle. The mean scores of the experimental group were similar to the baseline score. Statistically significant differentiation was not observed between the experimental and the control groups in any cycle.

Results were supported by a study done by Lötzke D et al**.** (2016) in Germany. Their results revealed that life satisfaction and fatigue symptoms improved with physical exercise intervention but with yoga intervention. Regarding quality of life, a direct effect of yoga intervention was found on role and emotional functioning, while with physical exercise intervention only emotional functioning improved. Significant improvements were observed in symptom scales for the two groups: dyspnea, appetite loss, constipation, and diarrhea. During chemotherapy, yoga was not seen as more helpful than physical exercise intervention.

Financial difficulty-Patients in the experimental and the control group experienced the same level of financial difficulty throughout the period of chemotherapy.

EORTC QLQ-BR 23 (Breast cancer specific module)

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 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.

Sexual Function & Sexual Enjoyment- The results showed a greater decrease in the mean scores of sexual function & sexual enjoyment 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.

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.

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.

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.

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.

Analysis revealed that a significant differentiation 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 yog, 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.

Strength of the study

1. This study is the first of its kind with a clinical trial and time series design to assess the effectiveness of yoga on the stress level and quality of life of breast cancer patients undergoing chemotherapy with follow up through the six cycles of treatment.
2. Concealed randomization of participants to control and experimental group was done.
3. There was a control group for comparison.
4. Patients were repeatedly reminded and encouraged to practice yoga through telephone calls by the investigator.
5. Yoga practice by patients, while receiving chemotherapy in all six cycles, was supervised by investigator.

Limitations of the study: Assessment of the effectiveness of yoga on quality of life and stress level 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.

Summary: This chapter included discussion of result on Sociodemographic variables, clinical variables, and effectiveness of yoga on anxiety, depression, stress and quality of life of breast cancer patients receiving chemotherapy with the help of studies done by other researchers.