



EFFECT OF YOGA ON QUALITY OF LIFE OF THE BREAST CANCER PATIENTS

Yoga

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ABSTRACT

The most common type of cancer among women is breast cancer. In this study, the impact of yoga on breast cancer patients' and survivors' health-related Quality of Life is examined. A sample of 91 women with breast cancer, ranging in age from 35 to 60, were selected from the Gujarat Cancer Research Institute in Ahmedabad, Gujarat. First- to third-stage cancer patients who were receiving chemotherapy, radiotherapy, or any other form of target therapy recommended by the hospital made up the research subjects. For 12 weeks, the participants took a daily, 45-minute yoga class. A research tool was the Psychological Well Being Scale (PWBS) Questionnaire, which was used to assess the quality of life (QOL) of breast cancer patients. To evaluate the effect of 12 weeks yoga training on QOL of breast cancer patients, Mann-Whitney test was performed to compare pre and post PWBS score. The median scores of pre and post PWBS data are 96 and 158, respectively and the p values obtained from Mann-Whitney test are less than 0.05 which confirmed that there is significant improvement in the QOL of breast cancer patients after 12 weeks of yoga program. The results imply that yoga have a highly positive impact and strongly recommended for the breast cancer patients. Yoga alleviates symptoms that breast cancer survivors frequently encounter.

KEYWORDS

Breast cancer, Psychological Well Being Scale, Quality of Life, Yoga, Mann-Whitney test

INTRODUCTION

Cancer is one of the most common causes of death around the world. It causes about 16% (or one out of every six) of all deaths worldwide, according to the World Health Organization.^[1] There are many different kinds of cancers. The most common cancers in the world are: breast cancer, lung cancer, colorectal cancer, prostate cancer and stomach cancer. Breast cancer is the most prevalent type of cancer among women. Increased life expectancy, urbanization, and the adoption of western lifestyles are regarded as the primary causes of the rising incidence in developing countries^[2].

Cancer is a type of disease where cells grow out of control, divide and invade other tissues. In a person without cancer, cell division is under control. In most tissues, healthy cells divide in a controlled way and copy themselves to create new healthy cells. With cancer, this normal cell division goes out of control. Cells change their nature because mutations have occurred in their genes. All the daughter cells of cancer cells are also cancerous. Cancerous cells are responsible for growing more cancer cells in the body. If the abnormal cells do not invade other tissues or organs, but just divide and swell up their original tissue, this is not called "cancer". It is called a tumour. Tumours are usually not a threat to life because they can be cut out. However, some tumours occur in places where they cannot be cut out, and they can be fatal. The symptoms of cancer are caused by the cancerous cells invading other tissues. This is called metastasis. Metastasis is when cancer cells move through the bloodstream or lymphatic system. When this happens, a person's cancer can be spread to other places in the body. Eventually those other tissues cannot work as well, and the whole body begins to get worse, and may die. Cancer can affect anybody at any age. Most types of cancer are more likely to affect people as they get older. This is because as a person's DNA gets older, their DNA may become damaged, or damage that happened in the past may get worse.

Physical and functional symptoms such as fatigue, pain, lymphedema, deconditioning-related functional changes, and cognitive dysfunction are common among breast cancer survivors after medical treatment^[3,4]. Additionally, due to treatment side effects like hair loss, body changes, comorbidity, and the possibility of recurrence or metastasis, breast cancer survivors report psychosocial difficulties like depression, anxiety, stress, anger, and stigma^[5-7]. These psychological problems often begin with the diagnosis of breast cancer and are the most common late consequences of breast cancer survivors^[8]. As a result, a decline in the quality of life for breast cancer survivors is intimately linked to the numerous physical symptoms encountered during the healing process as well as psychological issues like worry and sadness^[9,10]. These psychological problems operate as negative elements that

diminish the well-being of breast cancer survivors and hinder adaptation and the recovery of normal life.

Konieczny et al^[11] investigated the role of socio-economic and demographic factors on the quality of life of breast cancer patients. The QOL of women with breast cancer was influenced by their age, marital status, level of education, and financial position. Konieczny concluded that breast cancer patients with higher level of education and very good financial situation was associated with a higher QOL while higher age patients were associated with lower QOL. Many researchers^[12-14] investigated the role of Marital status on the QOL of breast cancer patients and found out married women with family have higher QOL compared to single and unmarried women. In these studies, it was found that women who did not have children significantly worse in the psychological area compared to patients with children.

Although lots of research work is already done to evaluate the effect of yoga on the QOL of breast cancer patients but not enough sample size was considered, which make their findings unreliable. The aim of this paper is to systematically assess if yoga may alleviate symptoms that breast cancer survivors frequently encounter and the evidence for effects of yoga on health-related quality of life and psychological health.

METHODOLOGY

A sample of 91 females suffering with Breast cancer ranging in the age of 35 to 60 years old, has been chosen from Gujarat Cancer Research Institute Ahmedabad, Gujarat. The research participants were from 1st stage to 3rd stage cancer patients and involved in Chemotherapy, Radio Therapy or any kind of target Therapy advised from the hospital. There was no control group in this study and analysis was conducted based on pre and post measurements.

A daily 45-minute yoga class for 12 weeks conducted as the study's intervention. Each yoga class was subdivided into six 10-minute sub-sessions. The yoga class regularly began and ended with prayer and gratitude: cooling breath, and loosening exercises, followed by meditation. The fidelity of the intervention was monitored and directed by a qualified yoga teacher. The details of the yoga module is provided below.

1. Prayer and Awareness: 3 minutes
2. Sukshma Vyayam: 10 minutes
3. Breathing exercises: 5 minutes (2 round of each)
 - a. Nostril Breathing
 - b. Sectional Breathing

4. Pranayam
- a. Anulom Vilom – 3 minutes
- b. Bhramri – 9 rounds – 2 minutes
5. Deep Relaxation Technique: 20 minutes
6. Prayer and Gratitude: 2 minutes

Psychological Well Being Scale (PWBS) Questionnaire was used as a research tool in this study to evaluate quality of life (QOL) index in Breast Cancer patient. PWBS Questionnaire was prepared according to 5-point Lickert technique and developed by Dr Devendra Singh Sisodia and Ms. Pooja Choudhary of Mohan Lal Sukhadia University Udaipur Rajasthan^[15]. The 5-point Lickert scale is a global scale that is used to assess attitudes and views. It is a scale with 5 answer options which has two utmost poles and a neutral option linked with intermediate answer options. A total of 50 items makes up this survey. A 5-point scale was used to score the PWBS Questionnaire. Positive and negative key items were included in the survey. From "Strongly Disagree, Disagree, Undecided, Agree to Strongly Agree," the response options were divided into five categories. Each question required participants to select one of five degrees of perception, ranging from 1 (strongly disagree), 2 (disagree), 3 (undecided), 4 (agree), and 5 (strongly agree).

Higher Quality of life levels are indicated by a higher score. Participants are classified as Very low, Low, Moderate, High, and Very High based on their total score on an individual questionnaire. According to the PWBS scale, very low QOL is defined as a score of 50-58; Low with score of 59-83, Moderate with 84-217, High with 218-242 and very high QOL is defined with score of above 242. A person with low and very low PWB score is suggested to take counselling and psychotherapy.

The questionnaire measures several aspects of Well Being like Satisfaction, Efficiency, Scalability, Mental health, and Interpersonal Relations. There are 50 questions in all, broken down into 5 categories: satisfaction, effectiveness, scalability, mental health, and interpersonal relations. There are 10 questions in each category. Therefore, PWBS questionnaire is highly useful to assess QOL index of Breast cancer patients and evaluate the role of yoga exercise.

The questionnaire data collected from the participants was coded and double-checked. Minitab version 19.0 was used to do the data analysis. Standard assumptions for statistical analysis is used that include a 95% confidence interval (acceptable level of risk, $\alpha = 0.05$), and an 80% power level.

RESULTS & DISCUSSION

The minimum sample size for this study is determined using accepted level of risk (α) of 0.05, power of the study ($1-\beta$), of 0.8 and moderate Effect size (d) of 0.5.

$$N = 2(Z_{\alpha} + Z_{1-\beta})^2 / d^2 = 2(1.96 + 0.8416) / 0.25 = 31$$

The required minimum number of samples to deduce a meaningful conclusion from the statistical test is in agreement with sample size table reported by Pallavi et.al^[16]. In this study sample size was 91, which is much higher than minimum required sample size.

Psychological Well Being Scale (PWBS) Questionnaire was used as a research tool in this study to evaluate quality of life (QOL) in Breast Cancer patient. Each Participants were asked to fill the PWB questionnaire before and after the end of 12 weeks yogic module. The Pre and Post PWB Scores are calculated based on the questionnaire filled before start of the yoga and after 12 weeks of the yogic module. First Normality of the pre and post PWB scores data is checked using Anderson-Darlington (AD) test. The p value of both the pre and post PWB data is less than 0.05. The p value less than 0.05 confirms that both pre and post PWB scores data are not Normally distributed. The graphical summaries from Normality test are shown in Figure (1).

Since pre and post PWB scores data are not normally distributed, standard parametric test like t-test or ANOVA tests cannot be used for the hypothesis test. Nonparametric tests such as Wilcoxon or Mann-Whitney tests are used for non-Normal data where median values of the two groups are compared. The null hypothesis states that population medians of pre and post PWB scores data are equal while the alternative hypothesis states that the medians of the two groups are different. In this paper, to evaluate the effect of yoga on QOL of cancer patients, Mann-Whitney test is used.

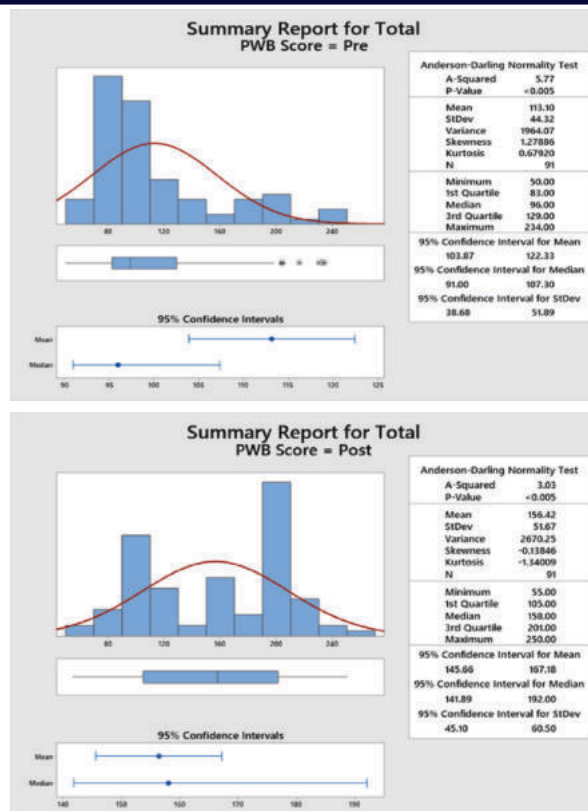


Figure (1) Graphical summaries of Normality test on pre and post PWB data from Minitab

Figure (2) shows descriptive and graphical (Box plot) summaries of Mann-Whitney statistical test on pre and post PWB scores data from Minitab. The median scores of Pre and Post PWB scores data are 96 and 158 respectively. The p-values obtained from the Mann-Whitney test are 0.0001 which is less than the significance level of 0.05, hence null hypothesis is rejected. p-value < 0.05 indicates significant difference between pre and post PWB scores data. The 95% confidence interval indicates that the median of post PWB score is likely to be higher than pre PWB value. The higher post PWB score value showed increase in Quality of Life. The Mann-Whitney statistic (W-Value) is the sum of the ranks of the first sample. Minitab calculates the Mann-Whitney statistic as follows:

1. Minitab ranks the two combined samples. Minitab gives the smallest observation rank 1, the second smallest observation rank 2, and so on.
2. If two or more observations are tied, Minitab assigns the average rank to both observations.
3. Minitab sums the ranks of the first sample.

Mann-Whitney: Pre_Total, Post_Total Method

η_1 : median of Pre_Total
η_2 : median of Post_Total
Difference: $\eta_1 - \eta_2$

Descriptive Statistics

Sample	N	Median
Pre_Total	91	96
Post_Total	91	158

Estimation for Difference

Difference	CI for Difference	Achieved Confidence
-42	(-66, -24)	95.02%

Test

Null hypothesis	$H_0: \eta_1 - \eta_2 \neq 0$	
Alternative hypothesis	$H_1: \eta_1 - \eta_2 \neq 0$	
Method	W-Value	P-Value
Not adjusted for ties	6286.00	0.0001
Adjusted for ties	6286.00	0.0001

Figure (2a) Descriptive summary of Mann-Whitney test between pre and post PWB score

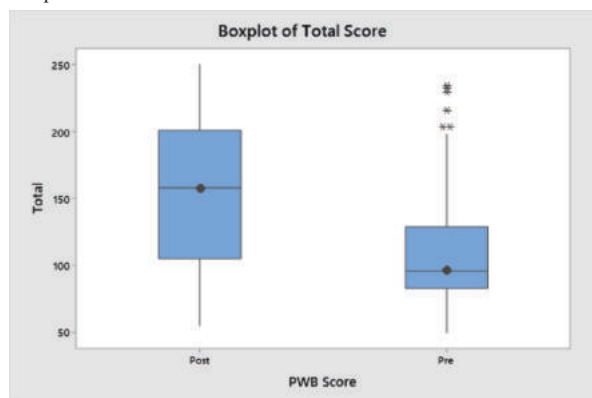


Figure (2b) Graphical summary of Box plot between pre and post PWBs score

Box plot showed the distribution of pre and post PWB scores and further confirmed that post PWB median score (158) is much higher than pre PWB median score (96). The width of the Box indicates the variation or standard deviation, higher the width of the box, higher is the variation / standard deviation. The standard deviation of post PWB score (51.67) is also higher than pre PWBs score (44.32). Therefore, it can be concluded that yoga is an effective way to improve the QOL of females suffering with Breast cancer patient.

The questionnaire measures several aspects of Well Being like Satisfaction, Efficiency, Scalability, Mental health, and Interpersonal Relations. All these 5 internal factors of PWB combinedly constitute QOL. To understand, how yoga impacts these internal factors Satisfaction, Efficiency, Scalability, Mental health, and Interpersonal Relations, Null and Alternate hypothesis are defined and statistically tested. Null hypothesis assumes there is no change in pre and post scores values while alternative hypothesis proves there is significant change. Since all PWB scores data are not normally distributed, non-parametric Mann-Whitney method is used for the hypothesis test. In Figure (3) Box plot of pre and post PWB factors are analysed.

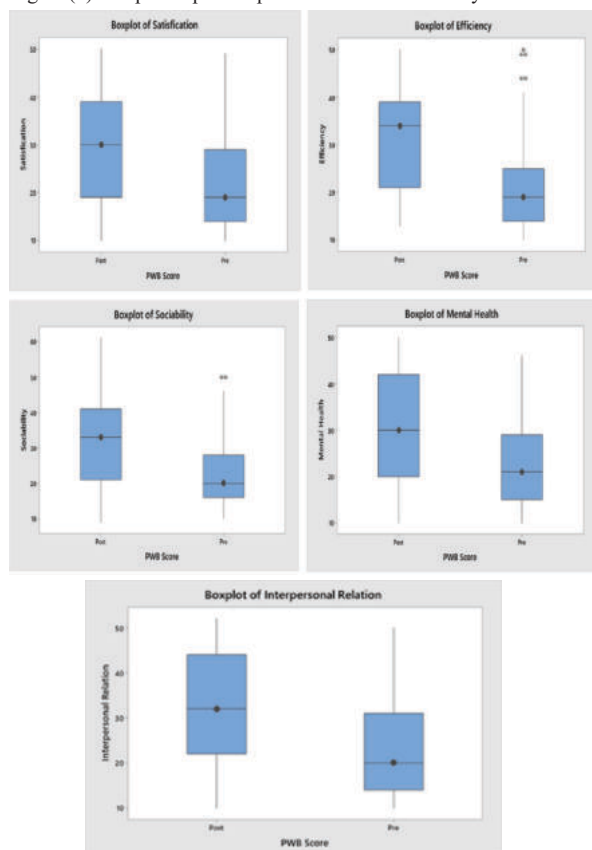


Figure (3) Box plot of pre and post PWB factors namely Satisfaction, Efficiency, Scalability, Mental health, and Interpersonal Relation, respectively

The results from Mann-Whitney statistics are summarized below. It is observed that post PWB data in each PWB category is improved significantly.

PWBs Data type	Pre Scores			Post Scores			Mann-Whitney test	
	Mean	Median	Stdev	Mean	Median	Stdev	W Value	p value
Satisfaction	22.03	19.00	10.04	29.66	30.00	11.02	6649	0.000
Efficiency	22.09	19.00	10.02	31.17	34.00	10.33	6291.5	0.000
Sociability	23.13	20.00	10.03	31.79	33.00	11.15	6475	0.000
Mental Health	22.6	21.00	9.29	30.79	30.00	11.6	6598	0.000
Interpersonal Relation	23.25	20.00	12.18	33.01	32.00	12.26	6479	0.000

The improvement in QOL of breast cancer patients after attending 12 weeks of yoga is attributed to physical, psychological, and spiritual impact on the patients. Yoga helps to keep the mind calm and prepare us to cope with the stressful situation peacefully. Yoga is beneficial in lowering treatment side effects, enhancing emotional well-being, and reducing depressive symptoms in cancer patients. Yoga offers a special overall mind-body experience because of the physical postures, rhythmic breathing, and mental practice it incorporates. Our results are in agreement with the reporting from Akhil Raj et.al.^[17]. He reported, women who practiced pranayama had less cancer-related fatigue than those who had only had radiation therapy. Pranayama was efficient in raising antioxidant levels of protein thiols and glutathione (GSH). When it comes to nausea and vomiting caused by chemotherapy, pranayama has been found to be more beneficial. Breathing techniques including Nadisodhana, Bhramari, Ujjayi, and Sheetal have a positive impact on patients with breast cancer receiving radiation therapies. These techniques are also useful in reducing emotional symptoms like annoyance, concern, anxiety, and impatience. In early breast cancer patients receiving adjuvant radiotherapy, pranayama may be able to manage self-reported psychological discomfort and modulate circadian patterns of stress hormones. Pranayama practice has provided innovative strategies that can be used as one of the reliable treatments to help breast cancer patients receiving radiotherapy deal with their emotional worries.

CONCLUSION

The results from Mann-Whitney statistics revealed that post PWB score is improved significantly in each five categories Satisfaction, Efficiency, Scalability, Mental health, and Interpersonal Relation. The median scores of total pre and post PWB data are 96 and 158, respectively and the p values obtained from Mann-Whitney test are less than 0.05, which confirmed significant improvement in the QOL of breast cancer patients after 12 weeks of yoga program. Yoga helps to calm the mind of breast cancer patients / survivors to cope better with their illness. Yoga also reduces symptoms and side effects such as pain, tiredness, sleep problems and depression. Yoga can sometimes help you to move around more quickly and easily after cancer surgery. Yoga cannot cure or prevent breast cancer, but it helps people with breast cancer to cope with symptoms and side effects. Overall, we found the practice of yoga is safe, when practiced under guidance of a trained teacher, and have no side effects. Yoga is recommended to incorporate for breast cancer patients and survivors.

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REFERENCES

- (1) Cancer: World Health Organization. 2022-02-03. Retrieved 2022-10-20
- (2) Daniel, S., Venkateswaran, C., Hutchinson, A., & Johnson, M. J. (2021). 'I don't talk about my distress to others; I feel that I have to suffer my problems.' Voices of Indian women with breast cancer: a qualitative interview study. *Supportive care in cancer: official journal of the Multinational Association of Supportive Care in Cancer*, 29(5), 2591–2600.
- (3) He, L.; Qu, H.; Wu, Q.; Song, Y. Lymphedema in survivors of breast cancer. *Oncol. Lett.* 2020, 19, 2085–2096.
- (4) Joly, F.; Lange, M.; Dos Santos, M.; Vaz-Luis, I.; Di Meglio, A. Long-term fatigue and cognitive disorders in breast cancer survivors. *Cancers* 2019, 11, 1896.
- (5) Amini-Tehrani, M.; Zamanian, H.; Daryaafzoon, M.; Andikolaei, S.; Mohebbi, M.; Imani, A.; Tahmasbi, B.; Foroozanfar, S.; Jalali, Z. Body image, internalized stigma and enacted stigma predict psychological distress in women with breast cancer: A serial mediation model. *J. Adv. Nurs.* 2021, 77, 3412–3423.
- (6) Mazon, M.; Smoot, B.J.; Mastick, J.; Mausisa, G.; Paul, S.M.; Kober, K.M.; Elboim, C.; Singh, K.; Conley, Y.P.; Mickevicius, G.; et al. Assessment of local tissue water in the arms and trunk of breast cancer survivors with and without upper extremity lymphoedema. *Clin. Physiol. Funct. Imaging* 2019, 39, 57–64.
- (7) Von Ah, D.; Storey, S.; Crouch, A. Relationship between self-reported cognitive function and work-related outcomes in breast cancer survivors. *J. Cancer Surviv.* 2018, 12, 246–255.
- (8) González-Fernández, S.; Fernández-Rodríguez, C.; Mota-Alonso, M.J.; García-Tejido,

- P.; Pedrosa, I.; Pérez-Álvarez, M. Emotional state and psychological flexibility in breast cancer survivors. *Eur. J. Oncol. Nurs.* 2017, 30, 75–83.
- (9) Ho, P.J.; Gernaat, S.; Hartman, M.; Verkooijen, H.M. Health-related quality of life in Asian patients with breast cancer: A systematic review. *BMJ Open* 2018, 8
- (10) Türk, K.E.; Yılmaz, M. The effect on quality of life and body image of mastectomy among breast cancer survivors. *Eur. J. Breast Health* 2018, 14, 205–210.
- (11) Konieczny, M., Cipora, E., Sygit, K., & Fal, A. (2020). Quality of Life of Women with Breast Cancer and Socio-Demographic Factors. *Asian Pacific journal of cancer prevention: APJCP*, 21(1), 185–193
- (12) Ramadas A, Qureshi AM, Dominic NA, et al (2015). Socio-demography and medical history as predictors of health-related quality of life of breast cancer survivors. *Asian Pac J Cancer Prev*, 16, 1479-85
- (13) Croft L, Sorkin J, Gallicchio L (2014). Marital status and optimism score among breast cancer survivors. *Support Care Cancer*, 22, 3027-34
- (14) Parker PA, Baile WF, De Moor C, Cohen L (2003). Psychosocial and demographic predictors of quality of life in a large sample of cancer patients. *Psychooncology*, 12, 183-93
- (15) Devendra, S.S., and Choudhary Pooja, (2012) Psychological wellbeing scale and Manual, National Psychological Corporation, Agra, (India).
- (16) Dr. Pallavi Tiwari, Dr. A P Vajpeyi, Sample size calculation for analysing the impact of yogic intervention on Occupational Stress, *International journal of Scientific Research*, Volume – 12, Issue – 08, August – 2023, PRINT ISSN No. 2277 – 8179
- (17) A.R. Akhilraj Role of Pranayama in breast cancer patients undergoing radiotherapy, *Conclave on Cancer Care & Research in AYUSH*, Volume 40, Issue Supplement | Year 2019