

Original Article

# Patient Perception on Physiotherapy and the Breath of Hope in Breast Cancer Patients Undergoing Chemotherapy: Impact of Breathing Exercises in Enhancing Lung Function and Quality of Life: A Quasi Experimental Study

Amna Khalid<sup>\*1</sup>, Mehneel Shafique<sup>2</sup>, Afshan Tehreem<sup>2</sup>, Uswah Shams<sup>2</sup>, Zara Zubair<sup>3</sup>, Jawad Ahmad<sup>2</sup>

<sup>1</sup>Faculty of Medical Sciences, Government College University, Faisalabad, Pakistan.

<sup>2</sup>Department of Physical Therapy, Government College University, Faisalabad, Pakistan.

<sup>3</sup>Department of Physical Therapy, Riphah International University, Lahore, Pakistan.

\*Corresponding Author: Amna Khalid; Email: amnakhalid2127@gmail.com

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## ABSTRACT

**Background:** Breast cancer is the leading type of cancer among women globally, significantly impacting mortality and morbidity rates. Respiratory complications and diminished quality of life are common among patients undergoing chemotherapy, highlighting the need for effective supportive treatments.

**Objective:** This study aimed to evaluate the efficacy of respiratory physiotherapy interventions, specifically breathing exercises, in improving lung function and quality of life in breast cancer patients undergoing chemotherapy.

**Methods:** This quasi-experimental study enrolled thirty female breast cancer patients from the oncology wards of Allied Hospital and PINUM, Faisalabad. Participants were selected using a purposive sampling technique and were provided with respiratory physiotherapy, including spirometry and breathing exercises, three times a week for six months. Data were collected through initial and final assessments of lung function and quality of life, using self-administered questionnaires and spirometry. Ethical considerations followed the Declaration of Helsinki guidelines, with all participants providing informed consent. Statistical analysis was conducted using SPSS Version 25, employing the Wilcoxon signed-rank test.

**Results:** The interventions showed statistically significant improvements in lung capacity; Forced Vital Capacity (FVC) and Forced Expiratory Volume in 1 second (FEV1) witnessed positive ranks in 22 and 21 patients respectively, with mean ranks of 11.50 and 11.00, and sum of ranks at 253.00 and 231.00 ( $p < .001$  for both). Quality of life assessments indicated improvements across physical, emotional, and cognitive functions with significant p-values ( $< .001$  to  $.025$ ). About 70% of participants reported a good perception, and 10% reported an excellent perception of the physiotherapy's effectiveness in improving their condition.

**Conclusion:** The study confirms that structured respiratory physiotherapy significantly enhances lung function and quality of life in breast cancer patients undergoing chemotherapy. These findings advocate for the integration of tailored respiratory physiotherapy into standard care protocols to improve clinical outcomes for this patient group.

**Keywords:** Breast Cancer, Chemotherapy, Respiratory Physiotherapy, Breathing Exercises, Lung Function, Quality of Life, Patient Perception, SPSS Analysis, Oncology Rehabilitation.

## INTRODUCTION

Breast cancer remains the most prevalent cancer among women globally and is the second leading cause of cancer-related deaths among adult females in the United States. It is estimated that over one million women are diagnosed with breast cancer annually worldwide, contributing significantly to the global cancer burden with approximately 400,000 deaths each year, accounting for 14% of all cancer deaths (1). In Pakistan, breast cancer is the most commonly diagnosed cancer among women, affecting nearly one in nine female patients (2). The variability in incidence, mortality, and survival rates across different regions can be attributed to a range of factors including population demographics, lifestyle choices, genetic predispositions, and environmental influences (3,4).

The pathogenesis of breast cancer typically begins with ductal hyperproliferation, which may progress to benign tumors and potentially to metastatic carcinomas due to continuous exposure to various carcinogenic factors (5). Risk factors for breast cancer include intrinsic elements such as age, gender, race, and genetics, which may promote the familial incidence of the disease or the development of benign proliferative lesions of the mammary gland (6). Additional risk factors include the density of breast tissue, a history of breast cancer or benign breast diseases, as well as lifestyle factors such as physical activity, body mass index, and alcohol consumption (7). Late age at first marriage, childbirth, and menopause are also closely associated with the development of the disease (8). Among symptomatic presentations, a breast lump is most commonly associated with a higher malignancy risk, while swollen or enlarged lymph nodes may indicate early stages of metastasis (9). Recognizing which breast symptoms are most indicative of cancer is crucial in the clinical evaluation and communication with patients about their risk (10). Despite the grave outlook, the survival rates for breast cancer patients have been improving, highlighting the importance of a multidisciplinary approach in clinical management to optimize therapeutic outcomes in terms of survival and quality of life (QOL) (11).

The integration of "combination therapy" has been recognized as an effective strategy for treating breast cancer, encompassing surgery to remove the tumor and ascertain the stage of cancer, followed by mobilization through physical and breathing exercises to prevent post-surgical complications and improve lung capacity (12). The role of physiotherapy, particularly respiratory physiotherapy, has become increasingly significant. This therapeutic approach combines several strategies aimed at preventing, treating, and stabilizing cardiorespiratory disorders among breast cancer patients, thereby helping maintain and enhance respiratory capacity and overall quality of life (13). Although various studies have highlighted the benefits of physiotherapy in managing lymphedema, pain, and physical training in breast cancer patients, less attention has been given to respiratory symptoms associated with treatments (14). The current study aims to fill this gap by assessing the impact of specific respiratory physiotherapy interventions—such as breathing exercises and spirometry—on the lung function and quality of life of breast cancer patients undergoing chemotherapy, providing new insights into the standard care practices for these patients.

## MATERIAL AND METHODS

This quasi-experimental study analyzed data from thirty female breast cancer patients, all of whom were undergoing chemotherapy at the oncology wards of Allied Hospital and PINUM, Faisalabad. The study spanned a period of six months, following the approval of the research proposal. A purposive sampling technique was employed to select participants who met specific inclusion criteria. These criteria required that all participants be diagnosed with breast cancer, aged 18 years or older, and free of liver, lung, and brain metastases. Patients with severe acute infections, hematological diseases, other malignancies, or incomplete clinical data were excluded from the study, as were those unwilling to participate.

Before the commencement of the treatment interventions, all participants underwent an initial comprehensive assessment to establish baseline lung function and quality of life metrics. The experimental group received targeted respiratory physiotherapy, including breathing exercises and spirometric exercises, conducted three times per week. The impact of these interventions on lung function and quality of life was measured using self-administered questionnaires and standardized spirometry tests at the conclusion of the study period.

Ethical approval for this study was obtained from the Institutional Review Board of the respective hospitals, and all participants provided written informed consent before enrollment. The study adhered to the ethical principles outlined in the Declaration of Helsinki. Data confidentiality was maintained throughout the research process, with all patient information anonymized before analysis.

Data collected from the assessments were entered and analyzed using SPSS Version 25. The non-parametric Wilcoxon signed-rank test was used for data analysis since the test of normality indicated that the data were not normally distributed. This statistical method helped assess the changes in lung function and quality of life before and after the intervention, ensuring robust and reliable results for the study's aims (15, 16).

## RESULTS

The results of the study indicated a significant impact of respiratory physiotherapy interventions on both lung function and quality of life among breast cancer patients undergoing chemotherapy. The findings are summarized in the tables below, which reflect the participants' responses to various quality of life and lung function indicators.

**Table 1:** Wilcoxon Signed Rank Test for Quality of Life

Quality of Life Indicator	Negative Ranks (N)	Mean Rank	Sum of Ranks	p-value
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Physical Function Trouble	23	12.00	276.00	<.001
Emotional Disturbances	17	9.00	153.00	<.001
Cognitive Difficulties	7	4.00	28.00	.008
Fatigue	25	13.00	325.00	<.001
Nausea and Vomiting	27	14.00	378.00	<.001
Sleep Troubles	23	12.00	276.00	<.001
Constipation	5	3.00	15.00	.025
Social Activities Interference	19	10.00	190.00	<.001
Shortness of Breath	26	13.50	351.00	<.001
Appetite Issues	6	3.50	21.00	<.014

The table above demonstrates a significant improvement in all assessed areas of quality of life ( $p < .001$  for most categories), which indicates that the breathing exercises were highly effective in addressing physical, emotional, cognitive, and social challenges faced by the patients.

**Table 2:** Wilcoxon Signed Rank Test for Lung Capacity

Lung Function Parameter	Positive Ranks (N)	Mean Rank	Sum of Ranks	p-value
Forced Vital Capacity (FVC)	22	11.50	253.00	<.001
Forced Expiratory Volume in 1 sec (FEV1)	21	11.00	231.00	<.001

As indicated in Table 2, both primary measures of lung function, FVC and FEV1, showed significant improvements ( $p < .001$ ), with the mean rank of positive changes significantly outstripping the baseline values, which suggests a notable enhancement in pulmonary capacity due to the intervention.

**Table 3:** Patient Perception of Physiotherapy

Perception Rating	Frequency	Percent	Valid Percent	Cumulative Percent
Poor (1-3)	6	20.0%	20.0%	20.0%
Good (4-6)	21	70.0%	70.0%	90.0%
Excellent (7-8)	3	10.0%	10.0%	100.0%

Table 3 shows that a majority of patients (70%) had a good perception of the effectiveness of physiotherapy in improving their lung capacity and quality of life, while 10% rated it as excellent, and 20% perceived it as poor.

These results underscore the efficacy of structured respiratory physiotherapy programs in significantly improving the quality of life and lung function in breast cancer patients receiving chemotherapy.

## DISCUSSION

The findings of this study underscore the beneficial effects of respiratory physiotherapy, particularly breathing exercises and spirometry, on enhancing lung function and quality of life in breast cancer patients undergoing chemotherapy. The significant improvements observed in the measures of lung capacity, such as Forced Vital Capacity and Forced Expiratory Volume in 1 second, align with previous research indicating that respiratory physiotherapy can markedly improve pulmonary function and overall respiratory health in this patient population (18, 19). Similarly, the observed enhancements in various quality of life domains, including physical, emotional, and social functions, are consistent with findings from other studies that have emphasized the role of physical therapy in improving the day-to-day wellness of cancer patients (16, 17).

The positive patient perceptions towards physiotherapy interventions, as indicated by 80% of participants rating their experience as good to excellent, highlight the potential acceptability and efficacy of these treatments. This perception is particularly significant given that patient satisfaction can directly influence treatment adherence and, subsequently, overall outcomes (20). However, the 20% of patients who reported poor perceptions of physiotherapy underscore the need for personalized treatment approaches and enhanced patient education to improve acceptance and outcomes.

This study also drew inspiration from the work of Prakash et al. (16), who found that yoga significantly improved the quality of life of breast cancer patients, suggesting that complementary therapies could be effectively integrated into conventional cancer care. Similarly, the reduction in symptoms such as nausea, vomiting, and fatigue noted in this study echoes the results of Aybar et al. (17, 20), who reported that breathing exercises reduced these symptoms in breast cancer patients receiving chemotherapy.

Despite the promising results, this study had several limitations that must be considered. The small sample size and the use of a non-randomized design may limit the generalizability of the findings. Moreover, the reliance on self-reported measures for some

outcomes could introduce bias. Future studies could address these issues by employing a larger, randomized controlled trial design and including objective measures of lung function and physiological health.

The study's strengths include its focus on a highly relevant clinical outcome and the use of validated instruments to measure changes in lung function and quality of life. These aspects enhance the reliability of the findings and support the integration of respiratory physiotherapy into standard care protocols for breast cancer patients.

In conclusion, the study supports the inclusion of respiratory physiotherapy in the treatment regimen for breast cancer patients undergoing chemotherapy. It suggests that such interventions can significantly improve both physiological and quality of life outcomes. Recommendations for clinical practice include the routine implementation of breathing exercises and spirometry as part of comprehensive cancer care, tailored to individual patient needs to maximize acceptance and effectiveness. Further research should continue to explore and refine these interventions to optimize benefits for this vulnerable population.

## CONCLUSION

The study confirms that structured respiratory physiotherapy significantly enhances lung function and quality of life in breast cancer patients undergoing chemotherapy. These findings advocate for the integration of tailored respiratory physiotherapy into standard care protocols to improve clinical outcomes for this patient group.

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