

Exploration of Body Image Perception and Nutritional Imbalances in Breast Cancer Patients Undergoing Chemotherapy: A Mixed Methodology

Vasanth Pandian Thommai Antony Savari Muthu¹,
Shankar Shanmugam Rajendran², Kannan Kasinathan³,
Duraikannu Anandhi⁴, Pradeepa Govindharaj⁵,
Nathiya Balasubramaniyan⁶, Bibilin Wilson⁷

^{1,5,6,7}Post Graduate, College of Nursing, Madras Medical College, Chennai-03 (Affiliated to The Tamilnadu Dr. MGR Medical University, Chennai)

²Principal, College of Nursing, Madras Medical College, Chennai-03 (Affiliated to The Tamilnadu Dr. MGR Medical University, Chennai)

^{3,4}Assistant Professor, College of Nursing, Madras Medical College, Chennai-03 (Affiliated to The Tamilnadu Dr. MGR Medical University, Chennai)

Abstract

Background: Breast cancer remains a significant global health concern, with chemotherapy being a cornerstone of treatment. Despite its efficacy, chemotherapy imposes profound physical and psychological challenges on patients, including nutritional imbalances and body image disturbances. These challenges impact the overall quality of life and treatment adherence, underscoring the need for comprehensive care approaches.

Objectives: The aim of the study was to explore perceived body image disturbances among breast cancer patients receiving chemotherapy, assess their nutritional status, and to determine the association between nutritional imbalances and selected sociodemographic variables.

Materials and Methods: A mixed-methods approach was employed, incorporating qualitative phenomenological and quantitative descriptive designs. Sixty breast cancer patients undergoing chemotherapy at Rajiv Gandhi Government General Hospital, Chennai, were purposively and conveniently sampled. Qualitative data from semi-structured interviews with five participants were thematically analysed, while quantitative data from 55 patients were collected using the 7-point Subjective Global Assessment (SGA) tool and analysed using SPSS.

Results: The study categorised the impact of chemotherapy into themes: physical effects, emotional and psychological effects, support systems, and adaptation and lifestyle changes. It also revealed that 80% of patients were well-nourished, 20% were mildly to moderately malnourished, and none were severely underweight, indicating a generally good nutritional status among participants. Sociodemographic variables such as age and residence influenced nutritional status, but marital status, education, and occupation showed no significant association.

Conclusion: The study highlights the critical role of holistic nursing care, integrating nutritional assessments and psychological support, to address the multifaceted challenges of chemotherapy in breast cancer patients. Comprehensive care protocols can improve patient outcomes and enhance their quality of life.

Keywords: Breast Neoplasms, Chemotherapy-Induced Side Effects, Nutritional Assessment, Body Image Disturbance, Mixed-Methods Research

Introduction:

Breast cancer is the most prevalent cancer worldwide, with an estimated 2.3 million women diagnosed in 2020, contributing to 685,000 deaths globally [1]. Accounting for 99% of cases in women, breast cancer also affects men, comprising 0.5–1% of cases [2]. The burden of this disease is anticipated to grow significantly, with new cases projected to exceed 3 million annually by 2040, a 40% increase, and deaths expected to surpass 1 million, reflecting a 50% rise from 2020 levels [3]. Advances in screening, early detection, and treatment modalities like chemotherapy have improved survival rates globally. However, the impact of breast cancer extends beyond survival, profoundly affecting patients' physical and psychological quality of life.

Chemotherapy is a cornerstone of breast cancer treatment, using cytotoxic agents to target rapidly dividing cancer cells [4]. While effective in controlling and eradicating cancer, it also causes a wide range of adverse effects by inadvertently damaging healthy cells with high division rates, such as those in hair follicles, the gastrointestinal tract, and bone marrow [5]. Approximately 65% of patients undergoing chemotherapy experience hair loss, which, although not physically harmful, often leads to significant emotional distress [6]. Fatigue is another common side effect, reported by up to 90% of patients, encompassing both physical and mental exhaustion that is often unrelieved by rest [7]. Additionally, 70–80% of chemotherapy patients suffer from nausea and vomiting despite advancements in antiemetic therapies [8].

Nutritional imbalances are a critical issue among breast cancer patients undergoing chemotherapy, with 60–85% experiencing anorexia and taste alterations, which significantly affect food intake and preferences [9]. Up to 50% of patients lose weight at diagnosis, with an additional 20–40% experiencing further weight loss during treatment due to gastrointestinal disturbances, including nausea, vomiting, mucositis, and diarrhoea [10]. Conversely, some patients gain weight due to hormonal shifts and metabolic changes, which increase the risk of recurrence and negatively impact long-term survival rates [11].

Body image disturbance is another significant concern, with many patients experiencing profound changes in self-perception due to hair loss, weight fluctuations, and surgical scars [12]. These changes can lead to decreased self-esteem, social withdrawal, and diminished psychological well-being. Qualitative studies highlight that hair loss is particularly distressing, symbolising femininity and identity for many women [13]. Weight changes and visible scars from mastectomy or lumpectomy further exacerbate these feelings, often causing patients to avoid social interactions and intimate relationships due to fear of judgment [14]. Despite the prevalence of these challenges, there is a lack of comprehensive research addressing the interplay between nutritional imbalances and body image disturbances in breast cancer patients receiving chemotherapy. Integrating both quantitative and qualitative methods is essential to capture the multifaceted impact of chemotherapy on patients. This study aims to bridge this gap, focusing on developing holistic care interventions that address both the physical and psychological needs of breast

cancer patients, ultimately enhancing treatment adherence and improving quality of life.

Materials and methods:

Research Approach and Design

A mixed-method approach with an Exploratory Sequential design was employed to comprehensively explore the nutritional imbalances and perceived body image disturbances among breast cancer patients undergoing chemotherapy. The qualitative part utilised a phenomenological design, while the quantitative part adopted a non-experimental descriptive design to gather both experiential and numerical data. The study was conducted over a period of four weeks in the Oncology Department of Rajiv Gandhi Government General Hospital, Chennai-03.

Study Population and Sampling

Participants for this study were selected based on predefined inclusion and exclusion criteria to ensure relevance and reliability. The inclusion criteria specified that participants must be breast cancer patients undergoing chemotherapy, aged 18 years or older, fluent in Tamil or English, willing to participate, and with stable cardiac status. Patients with cancers other than breast cancer, those with altered sensorium, and those critically ill at the time of data collection were excluded from the study. Participants were selected through purposive sampling for the qualitative part and convenient sampling for the quantitative part.

Data Collection Tools

For qualitative data, a semi-structured interview schedule was developed, comprising open-ended questions addressing body image perception, physical appearance changes, dietary habits, weight changes, coping strategies, and experiences related to body image during chemotherapy. Quantitative data were collected using the 7-Point Subjective Global Assessment (SGA). This validated clinical tool evaluates nutritional status through parameters such as weight change, dietary intake, gastrointestinal symptoms, functional capacity, and physical signs of malnutrition.

Data Collection Process

Data were collected using interviews and assessments. Qualitative data were gathered through semi-structured interviews with five participants. These interviews were audiotaped, transcribed verbatim, and analysed using thematic content analysis. Quantitative data from 55 participants were collected using the SGA scale and a sociodemographic questionnaire. Data were entered and analysed using SPSS to identify nutritional status and associated factors.

Ethical Considerations

The study received approval from the Institutional Ethics Committee at Madras Medical College, Chennai (No. IEC-MMC/ Approval/ 82042024) and permission from the Oncology Department Director. Informed consent was obtained from all participants, who were briefed about the study objectives, methods, and their right to withdraw at any time. Confidentiality was strictly maintained by anonymizing participant data.

Data Analysis

Qualitative data were analysed thematically, while quantitative data were processed using SPSS. Integrating qualitative and quantitative findings ensured triangulation, enhancing the depth and validity of the results. Data saturation was achieved when no new themes emerged in the qualitative analysis.

Results:**Qualitative Findings**

The qualitative analysis identified four themes with associated subthemes that highlighted the experiences of breast cancer patients undergoing chemotherapy.

Theme 1: Physical Impact of Chemotherapy

Patients frequently reported significant hair loss, a distressing side effect impacting their self-image.

"All my hair fell out; it was shocking and difficult to handle....." -Participant 1

Changes in taste were also common, affecting appetite and food enjoyment,

".....Everything tasted bland; I couldn't enjoy any of my meals." - Participant 4

Weight fluctuations were another concern, with some patients struggling to manage their health.

"My weight kept fluctuating; it was hard to keep track of what was normal....."-Participant 3

Theme 2: Emotional and Psychological Effects

Patients experienced isolation and social withdrawal, often staying home to cope.

"I just stopped going out; it was easier to stay home....." -Participant 2

Fear and anxiety were prevalent

"I was scared, but I had to stay strong for my family....." -Participant 5

Oscillations between hope and despair were common. revealed,

"Some days I felt hopeful; other days I just couldn't see the end of it." - Participant 3

Theme 3: Support Systems

Family support was pivotal for patients.

".....My family was everything; I couldn't have done it without them." -Participant 2

Emotional connections with friends and medical professionals also offered essential reassurance.

"My friends checked in often; their calls meant the world to me....." - Participant 3

Theme 4: Adaptation and Lifestyle Changes

Patients adopted dietary adjustments and faced reduced activity and mobility due to treatment effects.

"I had to change what I ate just to manage eating something." -Participant 4

Despite challenges, psychological resilience was evident

"Despite everything, I kept pushing through, focusing on getting better." - Participant 5

These findings underscore chemotherapy's profound physical, emotional, and social impacts, highlighting patients' resilience and the critical role of support systems.

Quantitative Findings:**Demographic Characteristics:**

The mean age of the breast cancer patients was 47.85 ± 5.81 years. Most breast cancer patients (61.82%) resided in urban areas and were married (100%). Most had higher secondary education (34.55%), belonged to nuclear families (74.55%), and were homemakers (58.18%). A mixed diet was predominant (69.09%), with Hinduism being the primary religion (58.18%). The second stage of the disease (41.82%) and diagnosis within 1-2 years (56.36%) were most common.

Nutritional Status

The analysis revealed that most patients (80.00%, n=44) were well-nourished, while 20.00% (n=11) were mildly to moderately malnourished. None of the participants were severely malnourished (Table 1). Weight loss data showed that 50.91% of patients experienced no weight loss, and 29.09% had less than 3% weight loss. Dietary intake assessment indicated that 60.00% consumed their usual full meal, while

23.64% consumed slightly less than three-quarters of their usual portion. Gastrointestinal symptoms were minimal, with 74.55% reporting no symptoms and 25.45% experiencing few intermittent symptoms. Most patients (85.45%) maintained full functional capacity, and 85.45% reported no or low stress. Muscle and fat depletion were not significant issues, as 81.82% of patients showed no depletion in both categories. There were no cases of severe oedema, with all patients either showing no oedema or mild to moderate levels.

Table 1: LEVEL OF NUTRITIONAL STATUS SCORE

Level of nutrition	Cancer patients	
	n	%
Severely malnourished	0	0.00%
Mild moderately malnourished	11	20.00%
Well nourished	44	80.00%

Mean Nutritional Scores

The overall mean nutritional status score was 53.13 out of a maximum score of 56, representing 94.88% of the total possible score. Gastrointestinal symptoms had the highest score (96.43%), followed by functional status and disease state (95.86%). Scores for dietary intake, muscle wasting, and fat stores were approximately 94.86%, while oedema had a perfect score of 100.00%, reflecting the absence of severe oedema among participants (Table 2).

Table 2: MEAN NUTRITIONAL STATUS SCORE

Nutrition status	Maximum score	Mean	SD	% of mean score
Weight loss	7	6.11	1.20	87.29%
Dietary intake	7	6.44	.76	92.00%
Gastrointestinal symptoms	7	6.75	.44	96.43%
Functional status	7	6.71	.71	95.86%
Disease state	7	6.71	.71	95.86%
Muscle wasting	7	6.64	.78	94.86%
Fat stores	7	6.64	.78	94.86%
Edema	7	7.00	.00	100.00%
TOTAL	56	53.13	4.08	94.88%

Association with Demographic Variables

The association between nutritional status and demographic variables was analysed using chi-square tests. Significant associations were found for age ($\chi^2=8.69, p=0.05$), residential status ($\chi^2=6.69, p=0.05$), and year of diagnosis ($\chi^2=6.81, p=0.05$). Patients aged over 55 years showed an equal distribution between mild to moderate malnourishment and well-nourished status, indicating vulnerability in older age groups. Urban residents were more likely to be well-nourished (88.24%) compared to rural (40.00%) and semi-

urban (75.00%) residents. Additionally, patients diagnosed within the last 1-2 years had the highest proportion of well-nourished individuals (90.33%), while those diagnosed over five years ago showed a decline, with 50.00% being mild to moderately malnourished.

Integration of Qualitative and Quantitative Findings:

Breast cancer patients undergoing chemotherapy experience significant physical, emotional, and nutritional challenges. Qualitative data highlighted themes like hair loss, emotional oscillations, and family support, reflecting the psychological toll and coping mechanisms. Quantitatively, 80% were well-nourished, but mild to moderate malnutrition affected 20%, with older age and rural residence being significant factors. Combined, the findings underscore the interplay between physical health, emotional resilience, and the critical role of support systems in patient outcomes.

Discussion:

Perceived Body Image Disturbances

Qualitative findings revealed that chemotherapy's physical effects, such as hair loss, taste changes, and weight fluctuations, significantly impacted patients' self-image and emotional well-being. Emotional responses included isolation, fear, and oscillations between hope and despair. Family and community support were critical in providing emotional and physical assistance, while dietary adjustments and psychological resilience were key coping mechanisms. These findings align with Kedida et al. (2024), who emphasised the multifaceted disturbances induced by chemotherapy and the psychological burden of physical changes [15].

Nutritional Status

Quantitative data showed that 80% of patients were well-nourished, with no cases of severe malnourishment. Mild to moderate malnutrition affected 20%, while 50.91% had no weight loss, and 29.09% experienced less than 3% weight loss. Most patients maintained a full dietary intake (60%) and experienced minimal gastrointestinal symptoms (74.55%). These results are consistent with Camilleri et al. (2024), who reported stable nutritional statuses among breast cancer patients due to proactive monitoring and dietary interventions [16]. The findings underscore the importance of regular nutritional assessments during chemotherapy to maintain adequate health.

Association with Sociodemographic Variables

Significant associations were observed between nutritional status and age, residential status, and year of diagnosis. Older patients (>55 years) were equally distributed between mild to moderate malnutrition and being well-nourished, indicating increased vulnerability with age. Urban residents showed better nutritional outcomes than rural and semi-urban counterparts, likely reflecting disparities in healthcare access. Patients diagnosed within 1-2 years had better nutritional health than those diagnosed longer ago, highlighting the impact of prolonged treatment on nutritional status. These results align with Ruth Adam et al. (2023), who emphasised the challenges older patients and those in less urbanised areas face in maintaining nutritional health [17].

Conclusion:

Breast cancer significantly impacts patients' physical, emotional, and nutritional well-being, particularly during chemotherapy. This study highlights the prevalence of body image disturbances, emotional challenges, and mild to moderate malnutrition, influenced by age, residence, and diagnosis timeline.

Comprehensive care strategies addressing these multifaceted needs, including nutritional interventions and psychosocial support, are essential to improve treatment adherence, outcomes, and overall quality of life.

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