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Original Article

Dietary Counseling and Nutritional Monitoring for Cancer Cachexia in Breast Cancer: A Randomized Controlled Trial

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Abstract

Objective: To assess the effectiveness of personalized dietary counseling and regular nutritional monitoring in improving cancer-related cachexia among women with breast cancer, using the validated Mini-Cancer Cachexia Score (Mini-CASCO).

Methodology: A parallel, single phase, two-arm interventional study was conducted at Fauji Foundation Hospital, Rawalpindi from June to December 2024. A total of 134 participants were randomized in a 1:1 ratio using block stratified allocation to either an intervention group (n=67), which received standard oncologic care supplemented with individualized dietary counseling and nutritional monitoring every 15–21 days, or a control group (n=67), which received standard care alone. The magnitude and severity of cachexia was assessed at baseline and 6 months using Mini-CASCO across five domains including body composition, inflammatory-metabolic profile, physical performance, appetite, and quality of life (QOL).

Results: Of 134 participants enrolled, 130 (97%) completed follow-up. After 6 months, the intervention group demonstrated a significant reduction in overall Mini-CASCO score ($\Delta=-14.4 \pm 5.1$; $p<0.01$; Cohen's $d=2.0$), whereas the control group showed only a small decrease ($\Delta=-2.6 \pm 4.9$; $p=0.03$). Between-group analyses demonstrated significant improvements attributable to the intervention across all Mini-CASCO domains, including body weight/composition ($\Delta=-5.2 \pm 2.6$), inflammatory–metabolic profile ($\Delta=-2.5 \pm 1.5$), physical performance ($\Delta=-1.8 \pm 1.1$), appetite/anorexia ($\Delta=-1.9 \pm 1.0$), and quality of life ($\Delta=-1.0 \pm 0.7$) (all $p<0.001$). The overall effect size was large (partial $\eta^2=0.38$), indicating strong clinical relevance.

Conclusion: Incorporating structured dietary counseling and nutritional monitoring into routine oncology care significantly attenuates cachexia and enhances functional, metabolic, and psychosocial outcomes in women with breast cancer. Mini-CASCO functioned effectively as an outcome tool for monitoring therapeutic response, supporting nutrition-sensitive strategies within cancer care pathways.

Keywords: Breast cancer, Cancer cachexia, Dietary counseling, Nutritional monitoring, Mini-CASCO, Randomized controlled trial.

Introduction

Cancer remains a major global health issue, with approximately 20 million new cases and 9.7 million cancer-related deaths reported in 2022.[1] By 2050, the global incidence of cancer is projected to increase by 77%, with low income countries accounting for nearly 70% of cancer-related morbidity and mortality due to limited access to early detection, advanced cancer therapies, and supportive care.[1] Among women, breast cancer is the most commonly diagnosed malignancy, with an estimated 2.3 million new cases and approximately 670,000 deaths recorded globally in 2022.[2] In LMICs, including Pakistan, breast cancer remains a major public health challenge due to late stage presentation and limited access to specialized oncology services. In Pakistan, about one in nine female is expected to develop breast cancer during her lifetime-the highest rate in Asia.[3] As a result, a significant number of patients present with late-stage disease which usually requires systemic chemotherapy. While chemotherapy is important for cancer control, it is also a major cause of cancer cachexia. This bidirectional relationship between cachexia and chemotherapy contributes to decline physical functional and poor treatment compliance.[4,5] Addressing cancer cachexia is therefore important for improving treatment outcomes and overall QOL in female oncology patients, especially in LMICs such as Pakistan.

Cachexia is a complex and multi-factorial metabolic syndrome including involuntary loss of weight, systemic inflammation, progressive loss of physical performance, and depletion of skeletal muscle mass. More than 80% of patients with advanced cancer are usually affected by cachexia and it is associated with 20% of cancer-related deaths.[6] Unlike starvation, cancer cachexia persists despite proper intake of calories, driven by neurohormonal and inflammatory dysregulation.[7] Argilés et al. (2011) formulated the CAchexia SCOre (CASCO) to support clinical assessment

and management of cancer-associated cachexia. It is a multi-dimensional scoring system used to assess five key domains including body weight and composition (BWC), inflammatory, metabolic or immunological disturbances (IMD), physical performance (PHP), anorexia (ANO), and quality of life (QOL) relevant to cachexia. Its simplified version which is also known as the Mini-CASCO retains high internal validity (r=0.96) while providing practicality for use in daily cancer care and RCTs.[8,9] Although evidence from HICs supports the use of nutritional interventions in cachexia, few comprehensive studies have been carried out in LMICs.[9-11] A study from India indicated improved body weight and appetite among female oncology patients as a result of culturally adapted dietary counseling.[12] However, no study in Pakistan has determined the impact of personalized dietary counseling and regular nutritional monitoring using the validated Mini-CASCO assessment tool among female breast cancer patients receiving chemotherapy. This gap underscores an urgent need for evidence-based resource-sensitive interventions in LMICs aligning with global frameworks, including the WHO Global Breast Cancer Initiative and Sustainable Development Goal (SDG) of good health and well-being which advocates integrated supportive cancer care to reduce cancer causing morbidity and mortality.

Therefore, this RCT was conducted to determine the impact of personalized dietary counseling sessions, alongside regular nutritional monitoring, on severity of cachexia in female oncology patients, as measured by the validated Mini-CASCO scoring system, at a major tertiary care center in Rawalpindi, Pakistan. Patients who were receiving the intervention would show high level of improvements in cachexia associated outcomes including BWC, systemic inflammation, PHP, appetite, and QOL as compared to those who were receiving standard oncology care only. Findings from this study may inform nutrition-specific measures for routine integration into oncology care in resource-constrained settings such as Pakistan.

Methodology

This was a prospective, parallel-group, two-arm, single-phase RCT designed to determine the impact of personalized dietary counseling combined with regular nutritional monitoring on cachexia severity in women with breast cancer, compared with standard oncological care alone. The severity of cancer cachexia was objectively measured using the validated Mini-CASCO scoring system which involves five key domains including BWC, inflammatory, metabolic or immune status, PHP, ANO, and QOL.

The study was conducted at the Department of Medical Oncology, Fauji Foundation Hospital (FFH), a tertiary care oncology center in Rawalpindi, Pakistan, with participant enrollment from March to July 2024 and a six months follow-up period. Ethical approval was sought from the Intuitional Review Board of FFH (794/RC/FFH/RWP). Both written and verbal informed consent was obtained from all participants prior to enrollment. The study was prospectively registered at ClinicalTrials.gov (NCT07112482).

The sample size for this study was estimated using G*Power software, assuming a moderate effect size (Cohen's d=0.5), a 95% confidence level and about 80% power. The calculation was based on an independent sample t-test comparing between-group differences in Mini-CASCO total score change at 6-month follow-up, which represents the primary endpoint of the trial. About 64 participants per group were required. The assumed effect size (Cohen's d=0.5) reflects a conservative, moderate treatment effect commonly used in behavioral and nutritional oncology interventions, particularly in the absence of robust local pilot data. This estimate is consistent with prior randomized trials evaluating nutritional or multimodal cachexia interventions that have reported small-to-moderate effect sizes for functional and composite cachexia outcomes. To account for potential attrition (10%), 140 patients were initially screened.

Participants were randomized (1:1) employing a computer-generated, block-stratified algorithm (block size=4), stratified by disease stage (locally advanced vs metastatic) and baseline Mini-CASCO severity (moderate vs severe). Allocation concealment was ensured via sequentially numbered, sealed, opaque envelopes. Participant enrollment was conducted by the principal investigator, with group assignment occurring after baseline assessment. The blinding of participants and intervention providers was not feasible because the intervention was behavioral and counseling-based. Outcome assessors responsible for Mini-CASCO scoring, laboratory measurements, and physical performance assessments were blinded to group allocation. Additionally, biostatistician conducting the statistical analyses was blinded until completion of the primary analysis, hence reducing detection and analysis bias.

Participants in the intervention group received personalized dietary counseling and regular nutritional monitoring in addition to standard oncological care for duration of 6 months. The follow-up period was chosen based on past literature showing that clinically relevant improvements in cancer cachexia usually require at a minimum 3 to 6 months.[13] The study object was a structured, personalized nutritional counseling program, implemented as a complex behavioral intervention targeting adequacy of energy-protein consumption, symptom-associated nutritional barriers, and compliance with evidence-based cachexia dietary recommendations. Comprehensive dietary plans were recommended for each patient, targeting an energy intake of about 25 to 30 kcal/kg per day and protein consumption of 1.2 to 1.5 g/kg/ per day were adjusted for the clinical status of patients, dietary tolerance, side effects of treatment, and individual choices or preferences.

Counseling sessions were delivered by certified clinical dietitians with experience in oncology nutrition, rather than by physicians or nursing staff, to ensure both feasibility and cost-effectiveness of implementation. Sessions were held every 15-21 days and lasted approximately 25–30 minutes, representing dietitian time per appointment. The dietary sessions involved key nutrition barriers such as symptom-associated eating difficulties, food aversion, texture modification, and measures taken to incorporate energy- and protein-dense foods. Dietary adherence was assessed using goal adherence checklists and structured food records. No additional nursing consultation or physician time was required beyond standard oncological care. Moreover, patients were advised to engage in light physical activities, such as stretching or walking according to their tolerance levels. Psychosocial support was offered by a certified psychologist to improve anorexia, fatigue and

emotional distress. Adherence was defined as attending at least 75% of scheduled meeting or sessions 80% or more of the personalized nutrition goals. To reduce attrition, patients who missed appointments were followed up during their next chemotherapy cycle and provided a rescheduled nutrition session.

The primary outcome was change (Δ) in cachexia severity, measured using validated Mini-CASCO assessment tool at enrollment and after six months. The Mini-CASCO tool comprises five domains including BWC, IMD, PHP, ANO, and QOL, each contributing to the overall cachexia score. Domain scores were calculated according to the original Mini-CASCO framework and aggregated into a weighted total score across domains. Data management involved de-identified study codes, double data entry, and multiple imputations for missing values, following standard Mini-CASCO analytic recommendations.

The data was analysed using Statistical Programme of Social Sciences (SPSS) version 25.0. Categorical variables were presented as frequencies and percentages while continuous variables as means and standard deviations (SD). Comparison of baseline characteristics between intervention and control groups was conducted using chi-square tests for categorical variables and independent t-tests for continuous variables. Primary analyses of Mini-CASCO total and domain scores over time were conducted using repeated-measures ANCOVA, adjusting for baseline values. Effect sizes were measured employing Cohen's d for within-group changes and partial eta squared value (η^2) for between-group comparisons. P-values < 0.05 were considered as statistically significant.

Results

A total of 140 patients were screened, of whom 134 met eligibility criteria and were randomized equally to the intervention group and control group (n = 67 per group). Following attrition (two participants from each group), 130 participants completed the six-month study period (n = 65 per group). Baseline characteristics of patients were comparable between intervention and control groups (Table 1). There were no statistically significant differences observed in age of participants, body composition, biochemical markers, energy intake, functional status, or Mini-CASCO total scores ($p>0.05$ for all variables), indicating effective randomization and group comparability. The CONSORT flow diagram (Figure 1) details participant enrollment, allocation, follow-up, and analysis. Table 1 further demonstrates that the groups were balanced at baseline, prior to initiation of dietary counseling and nutritional monitoring, supporting the validity of the randomization procedure.

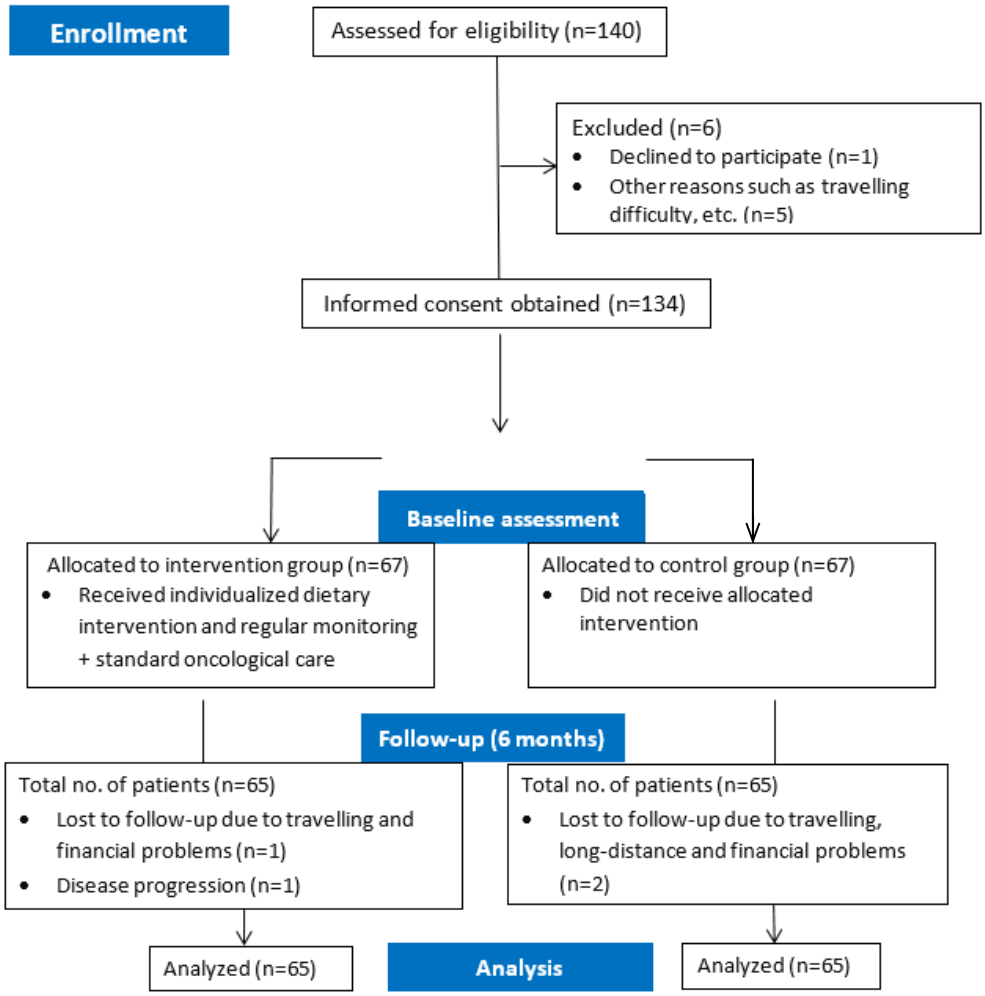

Figure 1. Study Consort diagram

Table 1: Baseline Characteristics of the Study Participants

Variable	Intervention group (n = 65)	Control group (n = 65)	p-value
	Mean ± SD	Mean ± SD	
Age at enrollment (in years)	48.7 ± 8.1	47.9 ± 7.6	0.51
Hb (g/dL)	10.7 ± 1.2	10.9 ± 1.1	0.38
Weight loss (% of usual body weight)	8.4 ± 2.6	8.2 ± 2.9	0.66
Lean body mass (kg)	34.8 ± 3.9	35.1 ± 4.4	0.53
CRP (mg/L)	18.1 ± 6.7	17.7 ± 5.9	0.48
Albumin (g/dL)	3.3 ± 0.4	3.2 ± 0.5	0.36
Total lymphocyte count (cells/mm³)	1280 ± 320	1245 ± 290	0.43
Daily energy intake (kcal/day)	1375 ± 210	1405 ± 195	0.27
ECOG performance status (median, IQR)	2 (1–2)	2 (1–2)	0.88
Physical performance score (PHP, 0-15)	9.4 ± 2.1	9.6 ± 2.3	0.61
Appetite Score (SNAQ, 4–20)	11.2 ± 2.7	11.5 ± 2.3	0.47
Quality of life score (EORTC, 0–100)	58.7 ± 9.4	57.3 ± 10.2	0.39
Total Mini-CASCO score (0–100)	32.4 ± 6.8	33.1 ± 6.5	0.51

Continuous variables were compared using independent-samples t-tests, while ECOG performance status was compared via the Mann–Whitney U test.

After six months, participants in the intervention group showed clinically and statistically significant improvements across all Mini-CASCO domains as compared to the control group (Table 2). The overall Mini-CASCO score, a validated multidimensional measure of cachexia severity, decreased in the intervention group from 32.4 ± 6.8 at baseline to 18.0 ± 5.9 at six months, corresponding to a mean change of -14.4 ± 5.1 ($p < 0.01$) and a large between-group effect size (Cohen's $d = 2.0$). In contrast, the control group exhibited a modest reduction in Mini-CASCO score, from 33.1 ± 6.5 to 30.5 ± 6.8 ($\Delta = -2.6 \pm 4.9$, $p = 0.03$), with a large within-group effect size ($\eta^2 = 0.38$), underscoring the substantial impact of the intervention.

Discussion

This RCT evaluated the impact of personalized dietary counseling sessions combined with regular nutritional monitoring on cancer-related cachexia among female oncology patients, using the multi-dimensional, validated Mini-CASCO assessment tool. The study was carried out as a multi-component strategy, integrating structured dietary counseling sessions and regular nutritional monitoring, psycho-social support, and guidance on light physical activity, according to contemporary recommendations for multi-dimensional assessment of cancer cachexia. Embedding personalized dietary counseling and nutritional monitoring into routine cancer care is grounded in the complex and multifactorial pathophysiology of cachexia, which involves systemic inflammation, ANO, physical debilitation, and metabolic dysregulation. Unlike other conventional strategies that focus mainly on weight loss, the Mini-CASCO scoring system provides a comprehensive evaluation across multiple domains related to cancer cachexia.[14] This study was designated to assess whether a structured, patient-centered nutrition intervention could significantly influence cachexia trajectories by not only improving body weight,

Table 2: Mini-CASCO Scores at Baseline and 6 Months Post-Intervention

Domain	Group	Baseline	6 Months	Δ in score	p-value
		Mean ± SD	Mean ± SD	Mean ± SD	
BWC (Weight loss, Lean body mass)	Intervention	13.4 ± 3.2	8.2 ± 2.8	–5.2 ± 2.6	< 0.001
	Control	13.6 ± 3.5	12.9 ± 3.7	–0.7 ± 2.9	0.12
IMD (CRP, Albumin, TLC)	Intervention	6.6 ± 2.1	4.1 ± 1.8	–2.5 ± 1.5	< 0.001
	Control	6.8 ± 2.0	6.5 ± 2.3	–0.3 ± 1.8	0.31
PHP (ECOG score)	Intervention	4.9 ± 1.5	3.1 ± 1.2	–1.8 ± 1.1	< 0.001
	Control	5.1 ± 1.6	5.0 ± 1.7	–0.1 ± 1.3	0.76
ANO (SNAQ score)	Intervention	4.9 ± 1.4	3.0 ± 1.1	–1.9 ± 1.0	< 0.001
	Control	5.1 ± 1.3	4.8 ± 1.5	–0.3 ± 1.2	0.44
QOL (EORTC QOL score)	Intervention	2.6 ± 1.2	1.6 ± 1.0	–1.0 ± 0.7	< 0.01
	Control	2.5 ± 1.3	2.3 ± 1.4	–0.2 ± 1.1	0.39
Total Mini-CASCO score	Intervention	32.4 ± 6.8	18.0 ± 5.9	–14.4 ± 5.1	< 0.001
	Control	33.1 ± 6.5	30.5 ± 6.8	–2.6 ± 4.9	0.03

P-values represent within-group comparisons from baseline to 6 months, analyzed using repeated-measures ANCOVA adjusted for baseline values. Δ is change in scores from baseline to 6 months.

but also enhancing muscle preservation, appetite, PHP, and overall QOL.

The findings revealed that personalized dietary sessions with regular nutritional monitoring significantly improved cachexia outcomes. However, given the multi-dimensional and integrated nature of the study, reported benefits should be interpreted as the synergistic and cumulative effect of dietary sessions, nutritional monitoring, psychosocial support, and guidance on light physical activity, rather than being attributed to dietary counseling alone. After six months, participants in the intervention group showed significant improvements across all Mini-CASCO domains, along with a significant decline in the overall Mini-CASCO score, indicating a positive impact of the nutrition intervention. On the other hand, the control group receiving routine oncologic care showed only a modest change in overall Mini-CASCO scores highlighting the limited impact of routine cancer care in improving complex and multidimensional nature of cachexia. This finding is in comparison with recent evidence from a multimodal intervention among patients with advanced lung cancer, which demonstrated that combined nutritional and physical measures significantly improved functional outcomes.[15] This nutrition intervention addressed this important public health issue by implementing personalized dietary counseling and regular nutritional monitoring, which resulted in improved treatment compliance and treatment outcomes.

In the BWC domain, weight and lean body mass changes demonstrated significant improvements in the intervention group, reflecting preservation of both skeletal muscle and overall body weight. Bye et al. (2020) also noted that timely nutrition support significantly reduced muscle wasting for BWC outcomes.[16] Similarly, van der Werf et al. (2020) reported that nutrition intervention when combined with encouragement of physical activity resulted in reduced loss of muscle mass during chemotherapy.[17] In our study, participants in the control group demonstrated a slight decline (-0.7 scores) in this domain, whereas those received dietary counseling and regular nutritional monitoring showed significant benefits, highlighting the significance of nutritional support in improving metabolic decline. Clinically, maintaining body weight and lean body mass is associated with increased treatment compliance and improved survival outcomes.[18] These findings emphasize the need for early dietary assessment and timely referral to nutrition services, especially for female oncology patients who may present with reduced baseline reserves and increased susceptibility to sarcopenia.

The IMD domain including key nutritional and inflammatory markers such as CRP, TLC and albumin indicated improvement in the intervention group, showing a significant reduction in systemic inflammation and improvement of nutritional status. On contrary, the control group indicated no significant change, highlighting the lack of passive nutrition advice in improving the inflammatory and metabolic components of cachexia. These findings align with numerous other studies indicating the dietary and immunomodulatory benefits of targeted nutritional interventions. For instance, Amiri et al. (2024) carried out a meta-analysis examining omega-3 polyunsaturated fatty acids in gastrointestinal oncology patients and found significant decline in CRP while albumin level was stable. In our study, mechanistic interpretation is limited to the nutritional and inflammatory biomarkers directly measured (CRP, hemoglobin, albumin, and TLC), and extrapolation to unexamined molecular pathways or cytokines should be considered hypothesis-generating rather than confirmatory. The mechanistic basis for these effects lies in the anti-inflammatory and anabolic properties of nutrients for instance omega-3 fatty acids, antioxidants, and protein-rich formulations, all of which were integral components of our dietary plans.[19] The observed changes in CRP and albumin are clinically relevant, given their established crucial role as early biomarkers of progression of cancer cachexia and predictors of morbidity and mortality in cancer patients. These findings highlight incorporation of

regular nutritional monitoring and inflammatory assessments into clinical guidelines for management of cancer-related cachexia, enabling timely identification and optimization of metabolic status of the patients.

The PHP domain, reflecting physical performance as measured by the ECOG performance status, improved significantly in the intervention group ($\Delta = -1.8 \pm 1.1$; $p < 0.001$). Physical performance was assessed using ECOG, a validated clinician-rated functional scale; however, objective measures such as gait speed, handgrip strength, or accelerometer were not included and may provide greater sensitivity for detecting functional changes in future studies. This finding is supported by a recent multimodal RCT in advanced lung cancer patients, where combined nutritional supplementation and regular exercise were significantly related to improvements in functional capacity, muscle mass, and quality of life.[20] The finding highlights that nutritional support must be accompanied by structured guidance, appetite optimization, and energy balance strategies to be effective. The observed correlation between enhanced energy intake and preserved physical function emphasizes the essential role of comprehensive functional assessments within cachexia management protocols. Accordingly, we recommend integrating dietary support with objective mobility tracking to monitor performance and preempt sarcopenia through early, individualized adjustments.

In the ANO domain, patients receiving dietary counseling showed a significant improvement in appetite scores ($\Delta = -1.9 \pm 1.0$; $p < 0.001$), while the appetite of control group remained stable. Appetite loss in cancer patients is multifactorial, driven by both disease-related metabolic changes and the adverse effects of cancer treatments. Our study supported patients through small, frequent meals, preference-based diet planning, and psycho-nutritional counseling. These findings are aligned with an Indian study, where an intervention combining dietary counseling and daily IAtta chapatis led to significant improvements in appetite and reduced fatigue over six months in female cancer patients under palliative care.[21] This culturally adapted, natural supplement and enriched chapati highlights the importance of sensory and cultural acceptability in nutritional interventions. Because appetite loss often results in cachexia, strategies that successfully enhance appetite may improve dietary intake, functional strength, and psychological well-being.[20] Future interventions should therefore incorporate behavioral strategies such as meal frequency adjustments, cultural preferences, and psychoeducation alongside dietary modifications to address anorexia effectively.

The QOL domain demonstrated a significant decline in the intervention group compared with a slight change in the control group highlighting the significance of a holistic cancer care approach. Wang et al. (2025) also reported that advanced stage oncology patients receiving integrated palliative care including nutritional counseling, psychological support, and symptom management indicated significantly improved QOL scores using the EORTC scale, particularly in social functioning and fatigue domains.[22] Patients in our study also reported improved emotional well-being and better treatment compliance and tolerance. This reinforces the significance of integrating nutritional measures within routine cancer care, rather than treating them as ancillary.

The overall Mini-CASCO score declined significantly in the intervention group from baseline and after 6 months, indicating clinically significant improvement. On the other hand, the control group experienced only a slight change, highlighting the lack of standard oncology care in improving cancer cachexia. These findings are in line with a RCT from South Korea reporting that a multi-modal intervention incorporating nutrition counseling, physical activity, anti-inflammatory agents, and psycho-social support significantly improved lean body mass and QOL compared to conventional oncology care.[23] The Mini-CASCO scoring system should be incorporated into oncology and palliative care settings for assessing both baseline cancer cachexia severity and monitoring of response to multi-modal interventions.[7] To improve treatment outcomes, clinical care pathways must include protocols for implementing nutritional assessment, dietary counseling, and regular monitoring, anchored by validated assessment tools like Mini-CASCO.

Overall, this study provides strong evidence that a personalized dietary intervention, combined with regular nutritional monitoring, significantly improved the progression of cancer cachexia. These findings should be taken as evidence supporting multi-disciplinary and integrated cancer care pathways rather than only nutritional strategies. The intervention yielded significant improvements across all Mini-CASCO domains compromising body weight, appetite, systemic inflammation, PHP, and QOL highlighting the multifactorial nature of cachexia and the need for integrated management. These findings advocate for the incorporation of structured, nutrition-specific care pathways within standard cancer care to improve patient outcomes and support comprehensive cancer care.

Limitations

This RCT employed a validated multimodal Mini-CASCO assessment tool alongside a comprehensive personalized dietary counseling program. Nonetheless, several limitations should be acknowledged. Dietary consumption data were self-reported, potentially resulting recall bias. Although compliance to the intervention was monitored, actual nutrient consumption was not biochemically examined, and variability in dietary consumption could not be objectively measured. The study population was limited to female oncology patients with late-stage breast cancer; therefore, the findings should not be generalized to male or to patients with other malignancies without further confirmatory studies. PHP was assessed using the ECOG tool rather than objective measures such as handgrip strength or gait speed, which may offer more comprehensive functional assessment. As this study was multi-component and composite, the independent role of specific nutrients or individual components could not be isolated. Lastly, due to the composite nature of the intervention, the independent impact of specific nutrients could not be isolated.

Conclusion

The findings indicated that integrating personalized dietary counseling sessions and regular nutritional monitoring with standard oncological care can significantly reduce the severity of cachexia in female breast cancer patients. Significant improvements were observed across all domains of the Mini-

CASCO score, including body composition, inflammatory-metabolic status, physical performance, anorexia, and quality of life. The Mini-CASCO tool indicated high clinical utility as a multidimensional and standardized instrument for assessing cachexia severity and monitoring treatment response. Its incorporation into routine oncology practice may enhance the accuracy of cachexia evaluation and support more effective, evidence-based nutritional interventions. Embedding personalized nutritional support within palliative and supportive oncology care not only improves appetite and preserves lean body mass but also contributes significantly to functional status and psychosocial well-being which are essential dimensions in the comprehensive management of cancer-associated cachexia.

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Conflict of Interest: None.

Data Sharing: Available upon reasonable request.

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