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Research Article

Role of Nutritional Support in Improving Psychological Aspects in Cancer Patients Post-radiotherapy at Sardar Patel Medical College, Bikaner

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Abstract



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Background: Post-radiotherapy, cancer patients frequently experience significant psychological distress, including anxiety and depression, which is often exacerbated by malnutrition. The interplay between nutritional status and psychological well-being is critical yet underexplored in integrated care models at many tertiary centers, including Sardar Patel Medical College, Bikaner.

Aim & Objectives: This study aimed to evaluate the impact of a structured nutritional support program on improving psychological parameters in cancer patients following radiotherapy. Primary objectives were to assess changes in anxiety and depression scores, with secondary objectives focusing on quality of life, nutritional status, and fatigue levels.

Materials and Methods: A prospective interventional study was conducted with 100 post-radiotherapy patients, randomized into an Intervention Group (n=50) receiving a 12-week personalized nutritional program (dietary counselling and oral supplements) and a Control Group (n=50) receiving standard care. Psychological assessment was performed using the Hospital Anxiety and Depression Scale (HADS), alongside evaluations of quality of life (EORTC QLQ-C30), nutritional status (PG-SGA), and biochemical markers at baseline and post-intervention.

Results: The intervention group demonstrated a statistically significant reduction in HADS scores for anxiety (14.2 ± 3.1 to 8.5 ± 2.4 ; $p < 0.001$) and depression (15.1 ± 3.4 to 9.3 ± 2.8 ; $p < 0.001$), with no significant change in the control group. Significant improvements were also observed in global quality of life scores (42.5 to 65.8), nutritional status (well-nourished patients increased from 10% to 62%), serum albumin, hemoglobin, and a marked reduction in reported fatigue.

Conclusion: A structured nutritional intervention significantly improves psychological well-being, quality of life, and nutritional biomarkers in post-radiotherapy cancer patients. This study advocates for the mandatory integration of dietitian-led nutritional support into standard oncology care protocols to facilitate holistic recovery.

Keywords: Nutritional Support, Psychological Distress, Cancer, Radiotherapy, Quality of Life, Anxiety, Depression.

INTRODUCTION

Cancer remains a significant global health burden, with treatment modalities like radiotherapy (RT) being a cornerstone of management. While effective, RT is often associated with debilitating side effects, including nutritional deficits, fatigue, pain, and psychological distress^{1,3}. At Sardar Patel Medical College, Bikaner, a significant proportion of oncology patients report diminished quality of life post-RT, marked by anxiety, depression, and a sense of helplessness. Emerging evidence underscores a bidirectional relationship between nutritional status and psychological well-being. Malnutrition can exacerbate fatigue and mood disorders, while psychological distress can lead to poor dietary

intake, creating a vicious cycle^{2,3}. Nutritional deterioration is common among cancer patients due to disease-related metabolic alterations and treatment-related adverse effects, significantly affecting treatment tolerance and recovery¹.

Psychological complications such as anxiety and depression are also highly prevalent among patients undergoing cancer treatment and can negatively influence quality of life and overall prognosis⁵. Instruments such as the EORTC QLQ-C30 and the Hospital Anxiety and Depression Scale (HADS) have been widely used to evaluate health-related quality of life and psychological distress in oncology patients^{6,7}.

Despite growing recognition of the importance of nutrition in cancer care, integrated nutritional interventions are not routinely standardized in post-radiotherapy management in many healthcare settings. Nutritional oncology emphasizes the role of targeted dietary interventions and nutritional support in improving clinical outcomes and enhancing patient well-being⁸.

Therefore, this study aims to address this gap by evaluating the impact of a structured nutritional support program on the psychological parameters of cancer patients following radiotherapy. The primary objective is to assess the efficacy of targeted dietary counselling and supplementation in reducing symptoms of anxiety and depression. Secondary objectives include evaluating improvements in nutritional biomarkers, patient-reported quality of life, and fatigue levels.

MATERIAL AND METHODS

This prospective, interventional study was conducted in the Department of Radiotherapy and Clinical Oncology at Sardar Patel Medical College, Bikaner, over a period of 12 months (January to December 2025). Ethical clearance was obtained from the institutional review board. A total of 100 adult patients (age >18 years) with histologically confirmed malignancies, who had completed a standard course of curative or palliative radiotherapy within the past four weeks, were enrolled. Patients with pre-existing severe psychiatric disorders or cognitive impairments were excluded. Participants were systematically randomized into two groups: the **Intervention Group (n=50)** and the **Control Group (n=50)**.

The control group received standard post-radiotherapy care, which included general advice on diet. The intervention group received a structured, personalized nutritional support program designed by a clinical dietitian and an oncology team. This included: 1) A comprehensive nutritional assessment at baseline, 2) Formulation of an individualized meal plan focusing on high-protein, high-calorie, and micronutrient-rich foods, 3) Provision of oral nutritional supplements (ONS) where indicated, and 4) Bi-weekly follow-up counselling sessions for 12 weeks. Data collection tools included: the Hospital Anxiety and Depression Scale (HADS) for psychological assessment, the EORTC QLQ-C30 for quality of life, the Patient-Generated Subjective Global Assessment (PG-SGA) for nutritional status, and laboratory parameters (serum albumin and haemoglobin). Assessments were performed at baseline (T0) and at the end of the 12-week intervention period (T1). Statistical analysis was performed using SPSS version 25, employing paired and unpaired t-tests and Chi-square tests, with a p-value <0.05 considered significant.

RESULTS

The study analyzed 100 patients (50 intervention, 50 control) with a mean age of 52.4 ± 10.7 years. Common cancer sites were head & neck (35%), breast (30%), and cervical (20%). At baseline, both groups were comparable in terms of demographic, clinical, and psychological parameters ($p>0.05$). Following the 12-week nutritional intervention, significant improvements were observed in the intervention group compared to the control group.

Table 1: Changes in Psychological Scores (HADS)

Group	Baseline Anxiety (Mean±SD)	12-week Anxiety (Mean±SD)	Baseline Depression (Mean±SD)	12-week Depression (Mean±SD)
Intervention	14.2 ± 3.1	8.5 ± 2.4*	15.1 ± 3.4	9.3 ± 2.8*
Control	13.8 ± 3.3	12.9 ± 3.5	14.7 ± 3.6	13.8 ± 3.7

*Significant reduction within group ($p<0.001$) and between groups ($p<0.001$).

Graph 1: Changes in Psychological Scores (HADS)

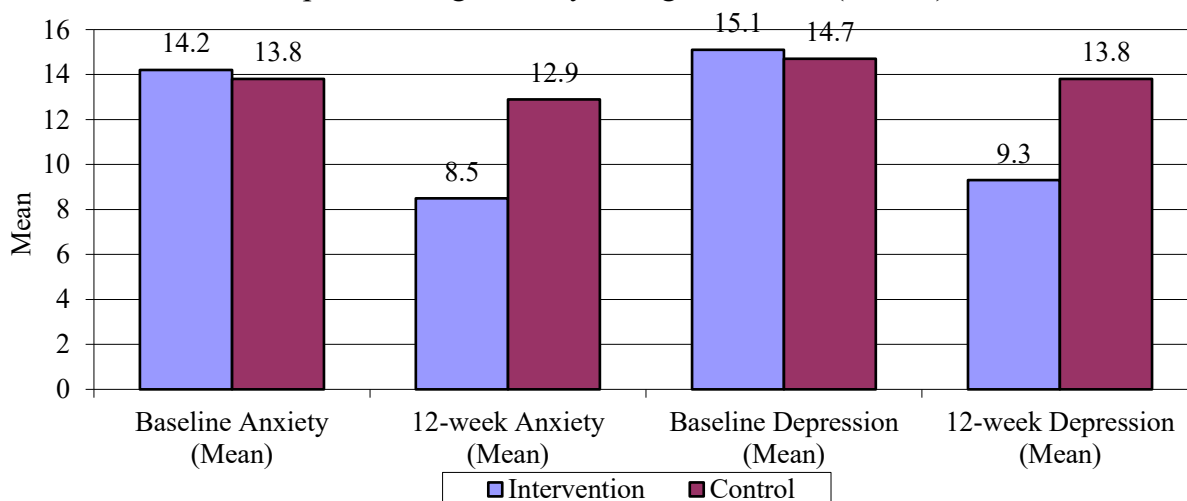


Table 2: Quality of Life (EORTC QLQ-C30 Global Health Status)

Group	Baseline Score (Mean±SD)	12-week Score (Mean±SD)
Intervention	42.5 ± 8.2	65.8 ± 9.1*
Control	43.1 ± 8.5	47.3 ± 9.4

Graph 2: Quality of Life (EORTC QLQ-C30 Global Health Status)

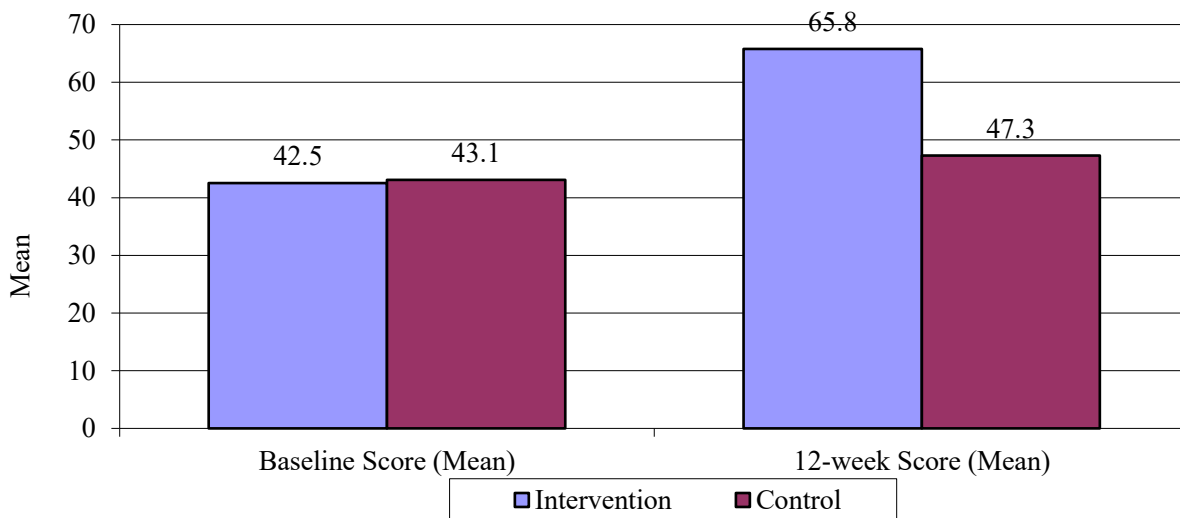


Table 3: Nutritional Status (PG-SGA Category)

Group	Well-Nourished (Baseline)	Well-Nourished (12-week)
Intervention	10% (n=5)	62% (n=31)*
Control	12% (n=6)	18% (n=9)

Graph 3: Nutritional Status (PG-SGA Category)

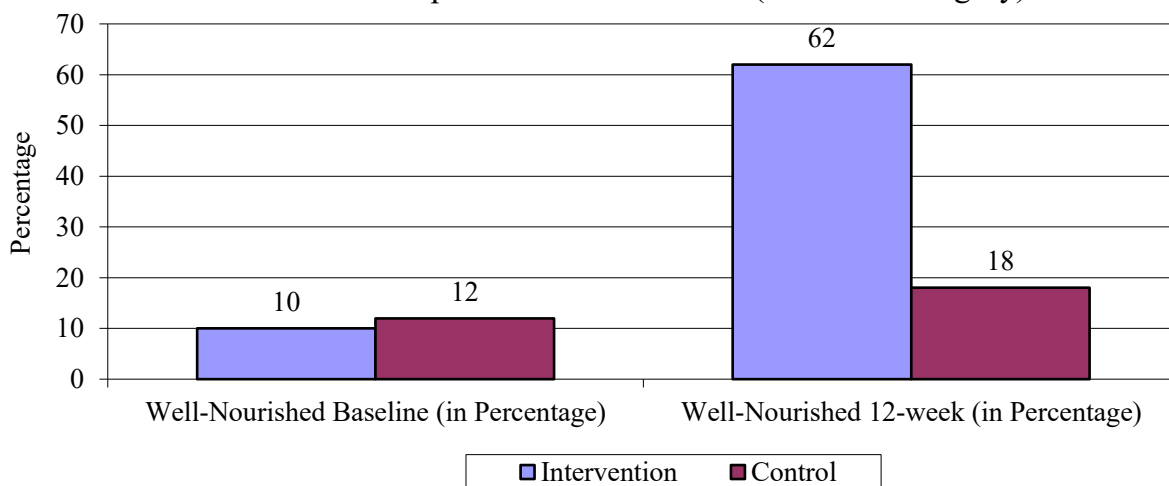


Table 4: Change in Biochemical Parameters

Parameter (Group)	Baseline (Mean±SD)	12-week (Mean±SD)
Albumin (g/dL) Int.	3.2 ± 0.5	3.9 ± 0.4*
Albumin (g/dL) Con.	3.3 ± 0.4	3.4 ± 0.5
Hemoglobin (g/dL) Int.	10.1 ± 1.3	11.8 ± 1.1*
Hemoglobin (g/dL) Con.	10.2 ± 1.4	10.4 ± 1.3

Graph 4: Change in Biochemical Parameters

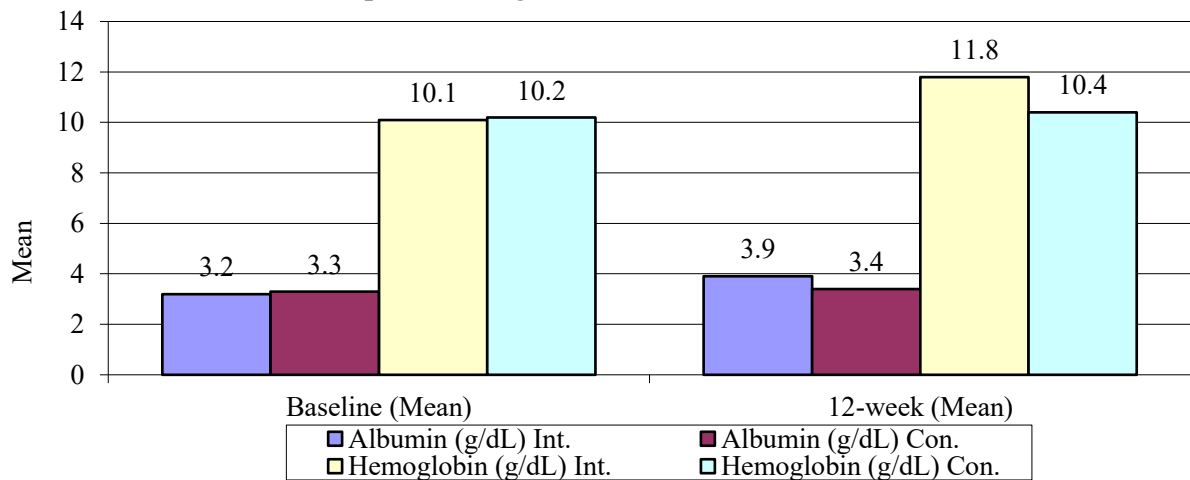
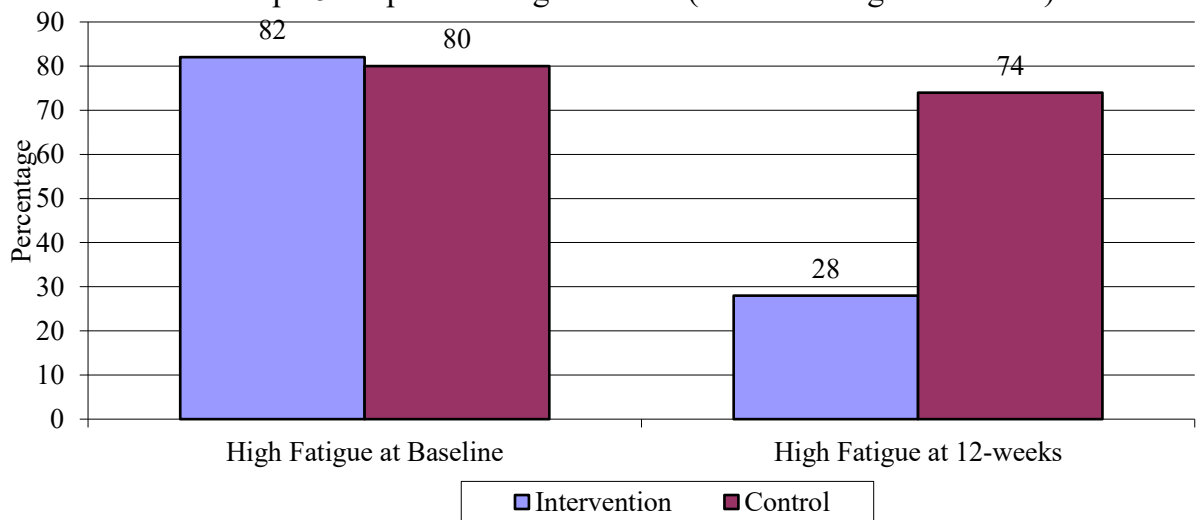


Table 5: Reported Fatigue Levels (EORTC Fatigue Subscale)

Group	High Fatigue at Baseline	High Fatigue at 12-weeks
Intervention	82% (n=41)	28% (n=14)*
Control	80% (n=40)	74% (n=37)

Graph 5: Reported Fatigue Levels (EORTC Fatigue Subscale)



DISCUSSION

The results of this study demonstrate a significant positive impact of structured nutritional support on the psychological well-being of cancer patients recovering from radiotherapy. The marked reduction in HADS scores for anxiety and depression in the intervention group underscores the profound link between physical nourishment and mental health. This improvement can be attributed to multiple factors. First, correcting nutritional deficiencies likely enhanced neurochemical synthesis and energy metabolism, directly improving mood and cognitive function. Second, reduced RT-induced symptoms like fatigue and mucositis, facilitated by better nutrition, indirectly alleviated psychological distress by improving functional capacity. Third, the regular counselling sessions provided psychosocial

support and a sense of agency, combating feelings of isolation and helplessness.

The concurrent improvement in serum albumin and haemoglobin levels validates the program's effectiveness in reversing cancer cachexia and anaemia, both known contributors to fatigue and depression. The dramatic shift in PG-SGA categories and the significant drop in reported fatigue levels further strengthen the argument for nutritional intervention as a core component of supportive oncology care. These findings align with previous studies in different settings but gain particular relevance in a tertiary care center like ours in Bikaner, where patients often present with advanced disease and suboptimal baseline nutrition. The limitations of this study include its single-center design, relatively short follow-up, and the potential for placebo effect from increased clinical attention in the intervention group.

Future studies with longer follow-up and cost-effectiveness analyses are recommended.

CONCLUSION

This study conclusively establishes that a structured, personalized nutritional support program is a highly effective non-pharmacological strategy for mitigating psychological morbidity in cancer patients following radiotherapy. By significantly reducing symptoms of anxiety and depression, improving quality of life, and enhancing nutritional status, such interventions break the detrimental cycle linking malnutrition and psychological distress. At Sardar Patel Medical College, Bikaner, these findings advocate for the mandatory integration of clinical dietitian-led nutritional rehabilitation into the standard post-radiotherapy care protocol. Implementing this low-cost, high-impact adjunct therapy can lead to more holistic patient recovery, potentially improving treatment tolerance and long-term survival outcomes. Nutritional support should therefore be recognized not merely as palliative care but as an essential component of comprehensive psycho-oncological management.

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Ethical approval: Not applicable.

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