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Role of Dietary Modification and Counselling in Cancer Patients: A 15-Day Follow-Up Observational Study

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Abstract

Background: Cancer and its treatments often impair nutritional status, yet dietary counselling remains underutilized. **Objectives:** To assess the short-term impact of individualized dietary counselling on nutritional intake, gastrointestinal symptoms, and functional outcomes in cancer patients. **Methods:** A 15-day prospective observational study was conducted among 169 adult cancer patients at Sir Ganga Ram Hospital, New Delhi. Dietary intake was measured using a 24-hour recall, and anthropometric parameters were recorded. Energy, protein, and gastrointestinal symptoms were evaluated before and after counselling. **Results:** Energy intake increased from 1123.8 kcal to 1331.7 kcal (+18.5%, $p < 0.05$) and protein from 42.3 to 52.9 g (+25%, $p < 0.05$). Head and neck cancer patients showed better improvements: energy +21.9% and protein +33.0% ($p < 0.001$). Significant reductions were observed in constipation, swallowing difficulty, vomiting, and diarrhoea, with appetite improving in over 52.6% and supplement use rising to 71.7%. **Conclusion:** Individualized dietary counselling resulted in significant short-term improvements in intake, symptoms, and functional status. Early, structured nutrition support should be integrated into routine oncology care.

Keywords: Cancer nutrition; Dietary counselling; Nutritional intake; Gastrointestinal symptoms; Head and neck cancer; Oncology care

1 Introduction

With changing lifestyle, non-communicable diseases have emerged as major health problems worldwide. After cardiac diseases, cancer has emerged as an important cause of morbidity and mortality in India. According to The National Centre for Disease Informatics and Research of the Indian Council of Medical Research (ICMR) at Bengaluru, India, 1.45 million cases of cancer were estimated to be diagnosed in 2016. This burden is likely to become double in the next 20 years^(1, 2). Treatments like chemotherapeutic, radiotherapeutic, immunotherapeutic, and surgical regimens, as well as the disease itself, can severely impair a patient's nutritional status. Factors such as nausea, vomiting, dysgeusia, and mucositis

often lead to insufficient food intake. Additionally, a cancer patient's energy needs often increase due to disease-related factors like inflammation. Nutrition care is an aspect of treatment that many cancer patients actively seek⁽³⁾. A large European survey reported that patients are often left with no access to evidence-based nutrition care as part of their treatment⁽⁴⁾.

Diet and nutrition play a crucial role in both cancer prevention and treatment, as an unhealthy diet can raise the risk of developing cancer, while malnutrition can reduce the effectiveness of cancer therapies⁽⁵⁾. Malnutrition is common in cancer patients, worsening quality of life and outcomes. It results from involuntary caloric restriction (due to nausea,

appetite loss) and cachexia (weight loss, inflammation, and metabolic disruption). Both deplete fat and muscle, impacting treatment and survival, but metabolic derangements are especially harmful, straining organ function⁽⁶⁾. Nutritional counselling and dietary modification are the primary treatment for malnourished cancer patients or those at risk of malnutrition, as it has been shown to effectively enhance protein calorie intake, promote weight gain, and improve body composition^(7,8).

Early identification of nutrition issues and adequate nutrition care should, therefore, no longer be viewed as an optional supportive element in cancer care but be recognized as a fundamental component of comprehensive cancer care⁽⁹⁾. This study aims to assess the short-term impact of dietary counselling and modification in cancer patients, addressing a critical gap in supportive care.

2 Material and Methods

This prospective observational study was conducted at Sir Ganga Ram Hospital, New Delhi.

A total of 169 adult patients (≥ 18 years) diagnosed with any type or stage of cancer, currently undergoing treatment at Sir Ganga Ram Hospital, New Delhi were included. Institutional Ethics Committee approval was obtained (Ref. No. EC/03/25/2664). Patients with life expectancy < 1 month, ICU admission, or cognitive impairment were excluded. Dietary intake was evaluated using the 24-hour Dietary Recall and energy and protein intakes were calculated based on the Indian Food Exchange List (Lady Irwin College)⁽¹⁰⁾ and the Indian Food Composition Tables (IFCT, 2017)⁽¹¹⁾. Anthropometric measurements included height, weight, and BMI, along with assessment of weight loss over the preceding three months. Gastrointestinal (GI) symptoms such as nausea, vomiting, and constipation were also recorded. Following dietary counselling, energy and protein intake, as well as GI symptoms, were reassessed after 15 days and patients were additionally asked about their use of nutritional supplements.

All participants received individualized, face-to-face dietary counselling delivered by trained clinical dietitians during active cancer treatment. Patients received counselling while they were undergoing chemotherapy, radiotherapy, or surgical management, depending on their treatment plan. Each counselling session lasted approximately 20–30 minutes. Dietary plans were protocol-driven, based on ESPEN 2021 guidelines with energy and protein targets of 25–30 kcal/kg/day and 1.2–1.5 g/kg/day, respectively⁽¹⁶⁾. Patients were provided written diet charts and symptom-specific dietary modifications (e.g., semi-solid diet for dysphagia, small frequent meals for nausea, low roughage diet for diarrhoea). Follow-up reinforcement was provided telephonically at Day 7 when required as per the identified gaps. Patients were counselled on dietary sources of protein.

Energy density of meals was enhanced using incorporation of items like nuts, ghee, creams, sattu and milk powders. Oral nutritional supplements were prescribed when dietary intake alone was insufficient.

Mobility was assessed at baseline and at follow-up using a simple 3-point functional scale:

(1) bed-bound, (2) ambulatory with assistance, and (3) independently ambulatory. Data were analysed using standard statistical software. Continuous variables were expressed as mean \pm standard deviation, and categorical variables as percentages. Paired *t*-tests were used to compare pre- and post-counselling energy and protein intake. A *p*-value < 0.05 was considered statistically significant.

3 Results

3.1 Baseline Characteristics

A total of 169 cancer patients were enrolled (Table 1), comprising 99 males (58.6%) and 70 females (41.4%), with a mean age of 57.5 ± 12.9 years (median = 58; IQR 51–67). Psychological stress was reported by 60.4% of participants. Unintentional weight loss in the previous three months was noted in 69.2%, with 66.9% losing 1–6 kg. Additionally, 28.6% reported a marked reduction in food intake, and only half the participants had fluid intake > 1.5 litres per day.

Table 1: Distribution according to cancer site (n = 169)

Cancer site	Frequency (n=169)	Percentage (%)
Head & Neck (H & N)	43	25.5
Gastrointestinal (GI)	41	24.3
Breast	13	7.7
Lung	12	7.2
Gynaecology	15	8.8
Genitourinary (GU)	6	3.5
Others	39	23

The mean baseline weight was 61.4 ± 18.8 kg and mean height 160.2 ± 22.1 cm. Based on Asian BMI classification⁽¹²⁾, 14.2% were underweight, 37.3% had normal BMI, 18.3% were overweight, and 27.8% were obese.

3.2 Nutritional Intake

Following individualized dietary counselling, a statistically significant improvement in both energy and protein intake was observed. Paired *t*-tests confirmed that the changes were statistically significant ($p < 0.05$) (Table 2).

3.3 Gastrointestinal and Functional Outcomes

All major GI and taste-related symptoms demonstrated statistically significant improvement after intervention.

Mobility significantly improved ($p = 0.001$), with a shift toward independent ambulation (Table 3).

Table 2: Energy and protein in cancer patients pre and post counselling

Parameter	Group	Precounselling (Mean \pm SD)	Postcounselling (Mean \pm SD)	Mean Change	% Change	p-value
Energy (kcal)	All cancer patients (n = 169)	1123.8	1331.7	+207.9	+18.5 %	< 0.05 *
	H & N (n = 43)	1018.8	1242.1	+223.2	+21.9 %	< 0.001 *
Protein (g)	All cancer patients (n = 169)	42.3	52.9	+10.6	+25.0 %	< 0.05 *
	H & N (n = 43)	39.1	52.0	+12.9	+33.0 %	< 0.001 *

Table 3: Change in GI and functional parameters pre- and post-counselling

Symptom / Parameter	Overall Baseline (%)	Overall Follow up (%)	Overall p-value (<0.05)	H & N cases Baseline (%)	H & N cases Follow-up (%)	H & N cases p-value
Dry mouth	29.0	20.1	0.004	41.9	32.6	0.059
Constipation	23.1	7.7	<0.001	27.9	7.0	0.003 *
Altered smell	8.3	1.8	<0.001	9.3	4.7	0.157
Altered taste	23.1	11.8	<0.001	23.3	11.6	0.059
Swallowing difficulty	37.9	27.8	<0.001	79.1	67.4	<0.001 *
Vomiting	21.3	2.4	<0.001	14.0	4.7	0.026 *
Diarrhoea	18.9	2.4	<0.001	18.6	4.7	0.007 *
Mobility	44.0	56.0	0.001	39.5	42.3	0.130

3.4 Appetite and Supplement Use

Across all cancer types, 52.6% of participants reported improved appetite post-counselling. By the end of 15 days, 71.7% were taking oral nutritional supplements, demonstrating good adherence to dietary advice. In the Head and Neck (H & N) subgroup, 51.2% reported improved appetite and 74.8% reported supplement use, reflecting good adherence to dietary recommendations.

4 Discussion

This study was undertaken to evaluate whether even a brief, individualized dietary counselling intervention could produce measurable and clinically meaningful improvements in the nutritional and functional status of cancer patients undergoing active treatment. In routine oncology practice, nutrition care is often delayed or deprioritized due to competing clinical priorities and the assumption that meaningful nutritional improvement requires prolonged intervention. By deliberately selecting a short follow-up period, this study aimed to assess the very early impact of dietary counselling and to determine whether timely nutritional guidance could translate into rapid benefits.

The findings demonstrated that individualized dietary counselling led to a short-term improvement in the nutritional status of cancer patients. After 15 days of intervention, mean caloric and protein intakes increased significantly among all participants, with even greater gains observed in the head and neck cancer subgroup ($p < 0.001$). The intervention also resulted in alleviation of gastrointestinal and taste-related

symptoms and improved mobility, reflecting a clinically meaningful enhancement in patients' overall well-being.

These findings are consistent with existing literature emphasizing the positive impact of nutrition intervention in oncology care. A randomized controlled trial on colorectal cancer patients by Zaid *et al.* (2016)⁽¹³⁾ reported improved nutritional status following intensive individualized counselling. Similarly, Keshtkar *et al.* (2025)⁽¹⁴⁾ found that nutrition counselling improved both quality of life and weight among patients with gastric cancer following total gastrectomy. The present study extends these observations by including patients across multiple cancer types.

The inclusion of head and neck cancer patients provided additional insight into a nutritionally vulnerable subgroup. Treatment-related dysphagia, mucositis, and altered taste frequently compromise dietary intake in this population. Despite these challenges, patients with head and neck cancers showed notable improvements in swallowing difficulty (79.1 \rightarrow 67.4%, $p = <0.001$), constipation (27.9 \rightarrow 7.0%, $p = 0.003$), vomiting (14.0 \rightarrow 4.7%, $p = 0.026$), and diarrhoea (18.6 \rightarrow 4.7%, $p = 0.007$). Functional mobility also improved markedly, with a near-elimination of bed-bound status. These results align with findings by Langius *et al.* (2013)⁽⁸⁾ who demonstrated that early nutritional intervention in head and neck cancer during chemo/radiotherapy improved nutritional status, quality of life, and even reduced mortality. Krzywon *et al.* (2023)⁽¹⁵⁾ similarly reported that nutritional counselling favourably influenced treatment outcomes in this patient group. The improvements observed across both the overall and subgroup analyses underscore the value of early and

individualized dietary management in oncology. As highlighted in the ESPEN practical guidelines (2021)⁽¹⁶⁾, continuous monitoring of dietary intake, weight, and BMI should commence at diagnosis.

An important contributor to the observed improvements was the increased adoption of Oral Nutritional Supplements (ONS) following counselling. Nearly three-quarters of participants reported ONS use at follow-up, highlighting the role of supplements in bridging nutritional gaps when oral intake is compromised. Several studies have shown that ONS use in cancer patients is associated with improved energy–protein intake, reduced weight loss, better treatment tolerance, and enhanced quality of life⁽¹⁷⁾.

This study has several limitations. The short follow-up duration of 15 days limits long-term outcome assessment. As an observational study, causal inference cannot be established. Additionally, dietary intake was self-reported, which may introduce recall bias.

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