

Case Report

Standardized Nutritional Care with a High-Energy, High-Protein Diet in Rectosigmoid Cancer Patients Undergoing Chemotherapy: Case Reports

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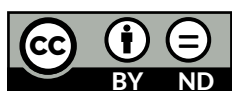
Article history

Received: 17 December 2025
Revised: 22 January 2026
Accepted: 26 January 2026
Published Online: 31 January 2026

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How to cite this article: Rahmat NS, Siswati T, Suryani I, Utami SB, Setyowati, Nurhidayat, Wirawan S. Standardized Nutritional Care with a High-Energy, High-Protein Diet in Rectosigmoid Cancer Patients Undergoing Chemotherapy: Case Reports. *Health Dynamics*, 2026, 3(1), 3-7. <https://doi.org/10.33846/hd30102>



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ABSTRACT

Rectosigmoid cancer patients undergoing chemotherapy are at high risk of malnutrition due to metabolic alterations and treatment-related gastrointestinal side effects. Evidence on the implementation of standardized nutritional care in primary healthcare settings remains limited. This study aims to evaluate the provision of standardized nutritional care with a diet high in energy and protein and its impact on the intake, nutritional status, and clinical condition of rectosigmoid cancer patients undergoing chemotherapy. The case was a 50-year-old male with stage III rectosigmoid cancer undergoing chemotherapy, who presented with undernourished status, diarrhea, reduced appetite, dysphagia-related discomfort, and anemia. Nutritional assessment identified inadequate oral intake and increased energy and protein requirements. Standardized nutritional care was implemented using the Nutrition Care Process (NCP) framework, including an individualized high-energy, high-protein (HEHP) diet and nutrition education for the patient and family. Dietary intake was monitored over three consecutive days using 24-hour food recalls. The patient demonstrated improved tolerance to oral intake, increased protein consumption, stabilization of body weight, and no worsening of gastrointestinal symptoms during the intervention period. This case illustrates that standardized nutritional care using a high-energy, high-protein diet can support dietary intake and help maintain nutritional status in rectosigmoid cancer patients undergoing chemotherapy, even in a primary healthcare setting. Early and individualized nutritional intervention may play an important role in preventing further nutritional deterioration and supporting comprehensive cancer care.

Keywords: Rectosigmoid cancer; chemotherapy; standardized nutritional care; high-energy diet; high-protein diet; case report

1. INTRODUCTION

Globally, the burden of cancer continues to increase, with new cancer cases projected to rise from approximately 20 million in 2022 to 35 million by 2050. According to the Global Cancer Observatory (GLOBOCAN), there were 19.9 million new cancer cases and 9.7 million cancer-related deaths worldwide in 2022.⁽¹⁾ Colorectal cancer ranks among the leading causes of cancer-related mortality globally. In Indonesia, colorectal cancer accounted for 35,676 cases (8.7%) of all new cancer cases and 19,255 deaths (7.9%) in 2022.⁽¹⁾ The Indonesian Health Survey 2023 reported 877,531 cancer cases nationwide, with 11,757 cases recorded in the Special Region of Yogyakarta.⁽²⁾ Furthermore, regional health data

indicated 831 new colorectal cancer cases with 159 deaths in Yogyakarta in 2024.⁽³⁾

Colorectal cancer is a malignancy of the colon and rectum and represents a major non-communicable disease contributing substantially to cancer-related morbidity and mortality.⁽¹⁾ Rectosigmoid cancer specifically involves the sigmoid colon and rectum and arises from uncontrolled epithelial cell proliferation.⁽⁴⁾ Clinically, rectosigmoid cancer often presents with lower gastrointestinal bleeding, including melena or hematochezia, which commonly results from tumor ulceration.⁽⁵⁾ These symptoms may be exacerbated by chemotherapy due to mucosal damage and alterations in the hemostatic system.⁽⁶⁾ In advanced stages, cancer-related pain and comorbid conditions further compromise patients' quality of life and clinical outcomes.⁽⁷⁾

Cancer treatment modalities include surgery, radiotherapy, and chemotherapy, selected according to disease stage and patient condition.⁽⁸⁾ Chemotherapy remains one of the most frequently used treatment options; however, it is commonly associated with adverse effects such as nausea, vomiting, diarrhea, reduced appetite, and metabolic disturbances.⁽⁹⁾ These effects place patients at high risk of malnutrition, particularly in colorectal cancer, where gastrointestinal function is already impaired.⁽¹⁰⁾

Adequate nutritional support is therefore a critical component of comprehensive cancer care. Clinical nutrition guidelines recommend the provision of a HEHP diet to meet increased metabolic demands, preserve nutritional status, and prevent treatment-related complications. The application of standardized nutritional care through the NCP enables systematic assessment, intervention, monitoring, and evaluation tailored to individual patient needs.

Despite increasing evidence supporting nutritional interventions in oncology, most published reports originate from tertiary or referral hospitals, while documentation of standardized nutritional care in primary healthcare settings remains limited. This case report aims to evaluate the implementation of standardized nutritional care using a high-energy, high-protein diet in a rectosigmoid cancer patient undergoing chemotherapy in a primary healthcare setting, focusing on its effects on dietary intake, nutritional status, and clinical condition.

2. CASE REPORT

The studied showed that 50-year-old male patients with a diagnosis of stage III rectosigmoid cancer undergoing chemotherapy were in a poor nutritional condition, with an initial body weight of 41.8 kg. Patients complained of diarrhea for three days, decreased appetite, pain when swallowing, and bowel movements accompanied by dark fluids. Biochemical examination showed anemia with a hemoglobin level of 11.1 g/dL and a number of erythrocytes of $4.43 \times 10^6/\mu\text{L}$.

Dietary intake at the beginning of monitoring did not meet energy and macronutrient requirements due to limited oral intake influenced by the patient's clinical condition. During the three-day monitoring period, feed intake showed fluctuations as shown in Figure 1. On the first day of monitoring, there was an increase in intake compared to the initial condition. On the second day, intake decreased along with the restriction of oral intake ahead of a complete blood test in preparation for advanced chemotherapy. On the last day of monitoring, intake again increased, especially in protein intake, along with increased consumption of protein sources, including high-protein milk. However, carbohydrate intake is still in the deficit category because patients limit the portion of rice consumption. Clinical monitoring showed an improvement in eating tolerance during the nutritional intervention. Patients are able to receive a High Energy High Protein diet given without worsening of gastrointestinal complaints. At the end of the monitoring period, the patient's weight increased to 41.9 kg, indicating a relatively stable nutritional status during intervention.

3. DISCUSSION

This study demonstrates that the implementation of standardized nutritional care using the NCP combined with a HEHP diet in a rectosigmoid cancer patient undergoing chemotherapy was associated with improved dietary tolerance, increased nutrient intake, and stabilization of nutritional status over a short monitoring period. Despite baseline gastrointestinal symptoms and anemia, the patient was able to tolerate oral intake without exacerbation of symptoms and maintain body weight, indicating a favorable short-term response to individualized nutritional intervention. These findings are consistent with evidence that early, targeted nutrition support can mitigate treatment-related

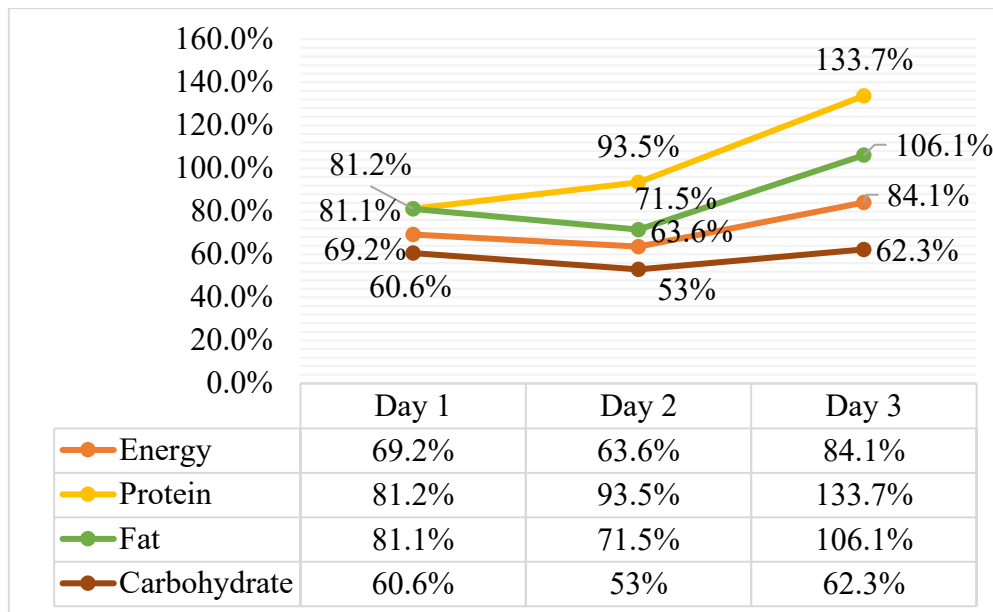


Figure 1. Trends in patients' macronutrient intake during intervention (3-6 November 2025)

nutritional deterioration in oncology patients.⁽¹¹⁾

Patients undergoing chemotherapy are particularly vulnerable to malnutrition due to the synergistic effects of cancer-associated metabolic alterations, systemic inflammation, and treatment-induced adverse effects such as nausea, diarrhea, mucositis, and anorexia.⁽¹²⁾ In colorectal and rectosigmoid cancer, impaired gastrointestinal function and bleeding further compromise nutrient absorption and intake, increasing the risk of negative energy balance and weight loss.⁽¹³⁾ The clinical presentation observed in this case, diarrhea, dysphagia-related discomfort, reduced appetite, and anemia, closely aligns with patterns reported in previous studies among colorectal cancer patients receiving chemotherapy.⁽¹³⁾

The use of the NCP framework allowed for a structured and systematic identification of nutrition problems and facilitated tailored intervention and monitoring.⁽¹⁴⁾ The nutrition diagnoses identified in this case insufficient oral intake, increased energy and protein requirements, and limited readiness for dietary change, are commonly reported among cancer patients undergoing systemic therapy. Previous studies emphasize that standardized nutrition care pathways improve consistency of care, enhance clinical decision-making, and support timely modification of dietary strategies in response to changes in patient condition.⁽¹⁵⁾

The HEHP diet intervention was central to addressing the patient's increased metabolic demands. ESPEN guidelines recommend energy and protein

intakes sufficient to prevent loss of fat-free mass, maintain immune competence, and improve tolerance to anticancer therapy.⁽¹⁴⁾ Although intake fluctuated during the monitoring period due to clinical procedures and temporary dietary restrictions, overall protein intake improved, particularly with the inclusion of high-protein milk. Protein adequacy is especially critical in cancer patients, as insufficient protein intake is strongly associated with muscle wasting, functional decline, and poorer clinical outcomes.^(16,17) The stabilization of body weight observed in this case suggests that the intervention contributed to preventing further nutritional deterioration during chemotherapy.

In this case, the patient's hemoglobin level of 11.1 g/dL indicates anemia in adult males. Anemia in colorectal cancer patients can occur due to chronic gastrointestinal bleeding, systemic inflammatory processes, and chemotherapy-related bone marrow suppression.⁽¹⁸⁾ Although anemia is not evaluated as an outcome in this case, the presence of anemia reflects the complexity of the patient's clinical condition and reinforces the importance of adequate nutritional support during chemotherapy. Fulfilling the optimal energy and protein needs as well as the source of Fe plays a role in supporting metabolic needs, maintaining functional capacity, and supporting the overall recovery process in cancer patients, including patients with anemia.⁽¹⁸⁾

Nutrition education provided to both the patient and family constituted an essential supportive component of care. Education regarding HEHP dietary

principles, food selection, and appropriate substitutions aimed to enhance adherence and sustainability of dietary changes.⁽¹⁹⁾ Evidence suggests that family involvement in oncology nutrition care improves compliance, particularly among patients experiencing appetite loss or gastrointestinal discomfort.⁽²⁰⁾ In this context, nutrition education functioned not only as knowledge transfer but also as an empowerment strategy to support ongoing dietary intake beyond supervised clinical encounters.

A notable contribution of this case report is its implementation of standardized nutritional care within a primary healthcare setting. Most published evidence on nutritional interventions in oncology originates from tertiary or referral hospitals,⁽¹⁴⁾ whereas documentation from primary healthcare facilities remains limited. This case illustrates that, with appropriate use of standardized frameworks and clinical guidelines, effective nutritional care for cancer patients can be delivered at the primary care level. Given the growing burden of cancer and the need for long-term follow-up during chemotherapy, strengthening nutrition services in primary healthcare is both feasible and strategically important.⁽¹⁹⁾

Although this report is limited by its single-case design and short duration of monitoring, it provides valuable clinical insight. The findings reinforce the importance of early, individualized nutritional intervention as an integral component of comprehensive cancer management. Furthermore, this case supports the need for future studies involving larger samples and longer follow-up periods to evaluate the impact of standardized nutritional care on nutritional status, treatment tolerance, and quality of life among colorectal cancer patients, particularly within primary healthcare settings.

4. CONCLUSION

This case report demonstrates that standardized nutritional care based on the Nutrition Care Process, combined with a high-energy, high-protein diet, can be feasibly implemented in rectosigmoid cancer patients undergoing chemotherapy within a primary healthcare setting. The nutritional intervention supported dietary tolerance, helped stabilize nutritional status, and contributed to maintaining the patient's clinical condition during chemotherapy.

These findings underscore the importance of early, individualized, and systematically monitored nutritional care as an integral component of comprehensive cancer

management. Although based on a single case with short-term observation, this report provides practical clinical insight into the potential role of primary healthcare services in delivering evidence-based nutritional care for oncology patients and highlights the need for further studies with larger samples and longer follow-up periods.

Ethical Approval

This study has been approved by KEPK Poltekkes Kemenkes Yogyakarta with reference no.: DP.04.03/e-KEPK.1/1184/2025.

Acknowledgement

The authors express their deepest gratitude to the respondents and their families who have been willing to take the time to participate in this study.

Competing Interests

All the authors declare that there are no conflicts of interest.

Funding Information

No funds were received for this study.

Underlying Data

Derived data supporting the findings of this study are available from the corresponding author on request.

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