

Literature Review

NUTRITION FOR CANCER PATIENTS IN DEVELOPING COUNTRIES

Yuni Sufyanti Arief¹, Siti Nur Qomariah^{2*}¹Faculty of Nursing, Airlangga University, Indonesia²Adi Husada College of Health Sciences, Indonesia

*Corresponding Author, Email: snurq1810@gmail.com

ABSTRACT

Introduction. Nutritional problems among cancer patients represent a major clinical and public health challenge because of cancer progression and treatment. In low- and middle-income countries (LMICs), limited healthcare infrastructure, delayed diagnosis, food insecurity, economic hardship, and inadequate nutritional support systems exacerbate the vulnerability of oncology patients. This study aimed to examine current evidence regarding nutritional issues, determinants of malnutrition, nutritional interventions, and barriers to nutritional care among cancer patients in developing countries. **Method.** This literature review from PubMed and SpringerLink focuses on malnutrition prevalence and oncology nutrition in LMICs. Emphasizing contemporary research from 2015 to 2026, the review includes both pediatric and adult oncology populations. **Result&Analysis.** The review highlights that malnutrition significantly influences treatment tolerance, quality of life, hospitalization, and survival outcomes. Evidence suggests that early nutritional screening, individualized dietary counseling, oral nutritional supplementation, and multidisciplinary oncology nutrition care can improve patient outcomes. However, implementation in developing countries remains constrained by insufficient resources, a lack of trained professionals, and limited integration of nutrition into oncology services. **Discussion.** Strengthening nutrition-focused cancer care policies and expanding evidence-based interventions are essential to improving cancer outcomes in resource-limited settings.

Keywords: Cancer Care, Cancer Nutrition, Developing Countries, Low-and Middle-Income Countries, Malnutrition, Nutritional Intervention, Oncology.

INTRODUCTION

Cancer has become a major global health concern, particularly in developing countries where the incidence and mortality rates continue to rise (Zhang, 2025). According to recent epidemiological evidence, low- and middle-income countries account for a substantial proportion of global cancer deaths due to delayed diagnosis, limited treatment accessibility, and inadequate supportive care systems. Nutritional status is increasingly recognized as a critical determinant of cancer

prognosis, treatment response, and patient survival. Malnutrition among cancer patients is associated with reduced immune function, impaired physical performance, increased treatment toxicity, prolonged hospitalization, and decreased quality of life.

The relationship between cancer and nutrition is complex and multidimensional. Cancer-related metabolic alterations, inflammation, cachexia, reduced appetite, nausea, vomiting, dysphagia, and gastrointestinal dysfunction are frequently

contribute to nutritional deterioration. In developing countries, these biological factors are further compounded by poverty, food insecurity, limited healthcare resources, cultural dietary practices, and inequitable access to nutritional counseling. Consequently, cancer patients in resource-limited settings often experience more severe nutritional deficiencies than patients in high-income countries (Richards, 2020).

Although the relationship between nutrition and cancer outcomes has been extensively discussed in global oncology literature, several important gaps remain, particularly within the context of developing countries. Most previous studies have primarily focused on clinical treatment modalities such as chemotherapy, radiotherapy, surgery, and targeted therapy, while nutritional care has often been positioned as a secondary supportive component rather than an integral aspect of cancer management. Consequently, the multidimensional influence of nutrition on treatment tolerance, quality of life, immune function, and long-term survival in resource-limited settings remains insufficiently explored.

Another major gap concerns the geographical imbalance of evidence. Existing oncology nutrition research is predominantly derived from high-income countries with advanced healthcare infrastructure, well-established nutritional support systems, and greater availability of oncology dietitians. These

healthcare conditions differ substantially from those found in low- and middle-income countries (LMICs), where cancer patients frequently encounter food insecurity, delayed diagnosis, limited access to nutritional supplements, financial hardship, and inadequate healthcare resources. Therefore, findings from developed countries cannot always be generalized to developing-country populations due to differences in socioeconomic status, healthcare accessibility, cultural dietary practices, and disease burden.

Furthermore, many previous studies have concentrated on isolated nutritional indicators such as body mass index (BMI), weight loss, or caloric intake without comprehensively examining broader determinants influencing nutritional status among cancer patients in developing countries. Factors including poverty, health literacy, cultural beliefs regarding food restrictions during cancer treatment, family support systems, rural healthcare disparities, and policy limitations remain underrepresented in the literature. This creates a significant knowledge gap regarding how structural and social determinants contribute to cancer-related malnutrition in LMIC settings.

Despite the recognized importance of nutrition in oncology care, nutritional management remains underdeveloped in many developing countries. Hospital systems frequently prioritize curative therapies while

Supportive nutritional care receives insufficient attention. In addition, shortages of dietitians, inadequate nutritional screening protocols, and limited awareness among healthcare professionals contribute to suboptimal nutritional management. Therefore, reviewing the current literature regarding nutrition among cancer patients in developing countries is essential to identify existing challenges, evidence-based interventions, and future directions for improving comprehensive oncology care.

METHOD AND ANALYSIS

This literature review was conducted using published scientific articles related to nutrition and cancer patients in developing countries. Relevant literature was identified through databases including PubMed, SpringerLink, Frontiers, MDPI, and other peer-reviewed journal sources. The review included systematic reviews, meta-analyses, observational studies, and clinical intervention studies discussing malnutrition prevalence, nutritional assessment, nutritional interventions, and oncology nutrition challenges in LMICs.

Articles published primarily between 2015 and 2026 were prioritized to ensure contemporary relevance. Keywords used in the literature search included “cancer nutrition,” “malnutrition in cancer patients,” “oncology nutrition in developing countries,” “nutritional

intervention,” and “LMIC oncology care.” Studies focusing on pediatric and adult oncology populations were both considered to provide a comprehensive overview.

RESULTS

Malnutrition among Cancer Patients in Developing Countries

Malnutrition is highly prevalent among cancer patients globally, but the burden is particularly severe in developing countries. Recent meta-analyses reported that approximately 40% or more of cancer patients experience malnutrition, with prevalence varying according to cancer type, disease stage, and treatment modality (Torbahn, 2020).

Patients with gastrointestinal cancers, head and neck cancers, lung cancer, and pancreatic cancer are especially vulnerable due to impaired food intake and metabolic disturbances. Cancer cachexia, characterized by involuntary weight loss and muscle wasting, further worsens nutritional status and contributes to poor treatment outcomes. In LMICs, delayed diagnosis often means patients present with advanced-stage disease, increasing the risk of severe nutritional deterioration before treatment even begins (Kim, 2016).

Socioeconomic conditions strongly influence nutritional outcomes in developing countries. Financial instability frequently limits patients’ ability to access nutrient-rich foods,

supplements, and supportive healthcare services. Additionally, many patients experience transportation difficulties, low educational attainment, and insufficient health literacy, which reduce adherence to nutritional recommendations. These conditions create a cycle in which malnutrition worsens treatment tolerance, while aggressive treatment further exacerbates nutritional decline.

Studies also demonstrate that malnutrition is associated with increased mortality risk, reduced treatment completion rates, higher postoperative complications, and diminished quality of life. The burden is particularly concerning in developing countries, where healthcare systems may lack adequate supportive care infrastructure to address these complications effectively.

Nutritional Assessment and Screening

Early nutritional assessment plays a critical role in identifying patients at risk of malnutrition before severe complications occur. Several nutritional screening tools have been widely used in oncology practice, including the Mini Nutritional Assessment (MNA), Patient-Generated Subjective Global Assessment (PG-SGA), and Global Leadership Initiative on Malnutrition (GLIM) criteria (Bullock, 2020).

Research indicates that the MNA can effectively predict poor outcomes such as mortality, reduced treatment tolerance, and decreased quality of life among cancer patients. Similarly, GLIM criteria

have become increasingly important for standardizing malnutrition diagnosis across clinical settings.

However, nutritional screening implementation remains inconsistent in many developing countries. Hospitals often lack standardized protocols for routine nutritional assessment, and healthcare professionals may receive limited training regarding oncology nutrition. In some settings, nutritional screening is performed only when patients already exhibit severe clinical symptoms, reducing opportunities for early intervention (Gerbi, 2026).

Another challenge involves limited laboratory and diagnostic resources. Accurate nutritional assessment frequently requires anthropometric measurements, biochemical indicators, and dietary evaluations that may not be readily available in resource-constrained facilities. Consequently, malnutrition may remain underdiagnosed and undertreated throughout the cancer care continuum.

Nutritional Interventions in Oncology Care

The literature consistently emphasizes the importance of early nutritional intervention for improving cancer treatment outcomes.

Nutritional counseling, oral nutritional supplementation, enteral nutrition, and individualized dietary planning are among the most commonly recommended approaches (Lee, 2016).

Nutritional counseling has demonstrated significant benefits in improving caloric intake, maintaining body weight, and reducing treatment-related complications. Studies show that individualized dietary counseling combined with oral nutritional supplements can produce more consistent improvements than supplementation alone. Early nutritional intervention is also associated with improved treatment adherence and better functional status during chemotherapy and radiotherapy.

In developing countries, however, implementation of nutritional interventions faces multiple barriers. Oral nutritional supplements may be financially inaccessible for many patients, while enteral or parenteral nutrition support may be limited to tertiary hospitals. Furthermore, cultural dietary beliefs sometimes influence food selection and treatment adherence. Some patients may avoid specific foods due to misconceptions regarding cancer progression, resulting in further nutritional inadequacy.

Community-based nutritional support programs may offer promising solutions in resource-limited settings. Integrating nutrition education into primary healthcare systems and involving family caregivers in nutritional management can enhance long-term patient support. Multidisciplinary collaboration between oncologists, nurses, dietitians, and social workers are also essential to improving

comprehensive nutritional care.

DISCUSSION

Challenges in Developing Countries

Developing countries face structural and systemic barriers that hinder effective nutritional management in oncology care. One of the most significant challenges is the shortage of trained oncology dietitians and nutrition specialists. Many healthcare facilities lack dedicated nutrition departments, leading to fragmented or inconsistent nutritional services.

Healthcare financing limitations also contribute substantially to inadequate nutritional care. In many LMICs, health insurance systems may not cover nutritional counseling or supplements, forcing patients to bear the costs independently. As a result, nutritional support becomes inaccessible for economically disadvantaged populations.

Another important issue involves healthcare infrastructure disparities between urban and rural regions. Patients living in remote areas frequently experience delays in diagnosis and reduced access to specialized oncology services. Consequently, nutritional deterioration may become severe before appropriate interventions are initiated.

Moreover, public awareness regarding cancer nutrition remains limited. Misconceptions about diet during cancer treatment are common, and some patients rely on unverified alternatives,

dietary therapies. Low health literacy may impair patients' understanding of balanced nutrition and reduce adherence to evidence-based dietary recommendations.

Future Directions and Recommendations

Improving nutritional care for cancer patients in developing countries requires a comprehensive and multidisciplinary approach. Governments and healthcare institutions should prioritize integrating nutritional screening into routine oncology practice. Standardized assessment tools such as GLIM and PG-SGA should be implemented consistently across healthcare facilities.

Capacity building is equally important. Training programs for healthcare professionals should emphasize the role of nutrition in cancer management, particularly for nurses and primary healthcare providers who frequently interact with patients. Expanding the availability of oncology dietitians would strengthen individualized nutritional support services. Policy development is also necessary to ensure equitable access to nutritional interventions. Subsidizing oral nutritional supplements and incorporating nutrition services into national health insurance programs could reduce financial barriers for vulnerable populations.

A study limitation in existing literature is the lack of multidisciplinary integration. Current evidence often separates nutritional care from

psychosocial, behavioral, and healthcare-system dimensions. In practice, however, cancer nutrition is influenced not only by physiological changes but also by emotional distress, economic instability, treatment side effects, social support, and healthcare communication. The absence of integrated perspectives limits the development of holistic oncology nutrition interventions suitable for developing countries.

Methodologically, many previous studies employ cross-sectional designs that primarily describe prevalence rates of malnutrition without investigating longitudinal nutritional trajectories or evaluating long-term intervention effectiveness. Intervention-based research examining sustainable, low-cost, and culturally adaptive nutritional programs in developing countries also remains limited. Consequently, there is insufficient evidence regarding the most effective nutritional strategies for improving survival, quality of life, and treatment adherence among cancer patients in resource-constrained healthcare systems.

Future research should focus on culturally appropriate nutritional interventions tailored to LMIC contexts. More longitudinal and intervention-based studies are needed to evaluate the long-term effectiveness of nutrition programs in improving cancer survival, quality of life, and healthcare utilization outcomes in developing countries.

CONCLUSION

Nutrition plays a fundamental role in the management and prognosis of cancer patients, particularly in developing countries where healthcare disparities and socioeconomic challenges intensify the burden of malnutrition. Current evidence demonstrates that malnutrition significantly affects treatment outcomes, quality of life, hospitalization, and survival among oncology patients. Early nutritional assessment and intervention are critical components of comprehensive cancer care.

Nevertheless, developing countries continue to face substantial barriers, including limited healthcare infrastructure, inadequate nutritional screening systems, shortages of trained professionals, and financial constraints. Strengthening oncology nutrition services through policy reform, multidisciplinary collaboration, healthcare professional training, and evidence-based interventions is essential for improving patient outcomes in resource-limited settings.

As cancer incidence continues to rise globally, integrating nutritional care into oncology

management should become a healthcare priority, particularly within developing countries where the burden of cancer-related malnutrition remains disproportionately high.

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