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IMPACT OF NUTRITIONAL SUPPLEMENTATION ON HOSPITALIZED PATIENTS

IMPACTO DA SUPLEMENTAÇÃO NUTRICIONAL EM PACIENTES HOSPITALIZADOS

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ABSTRACT

Hospital malnutrition is a frequent and often underestimated condition that worsens clinical outcomes, increases mortality, and prolongs hospitalization. This study aimed to evaluate the impact of oral nutritional supplementation on hospitalized patients, analyzing anthropometric parameters at admission and discharge. A retrospective, descriptive, and observational study was conducted in a medium-complexity hospital in Santa Maria, RS, Brazil, between August 2024 and March 2025. Medical records of adult and elderly patients at nutritional risk or with malnutrition were reviewed. Anthropometric measures such as weight, body mass index (BMI), mid-upper arm circumference (MUAC), and calf circumference (CC) were compared before and after nutritional intervention. The sample consisted of 34 patients, mostly male (73.5%) and elderly (mean age 63.5 years). After supplementation, BMI showed a slight but statistically significant increase (from 19.1±3.7 to 19.5±3.9; p=0.003), while weight, AC, and CC remained stable. Despite the absence of major changes in nutritional classification, maintaining anthropometric stability during hospitalization indicates a positive effect of nutritional supplementation. The results highlight the relevance of early screening, individualized nutritional therapy, and the inclusion of hypercaloric and hyperproteic supplements to prevent the worsening of malnutrition in hospitalized patients, especially the elderly. The findings reinforce the need for continuous monitoring and further studies to improve hospital nutritional care.

Keywords: Nutritional Assessment; Protein-Calorie Malnutrition; Oral Nutritional Supplementation.

RESUMO

A desnutrição hospitalar é uma condição frequente e frequentemente subestimada, que agrava os desfechos clínicos, aumenta a mortalidade e prolonga o tempo de internação. O presente estudo teve como objetivo avaliar o impacto da suplementação nutricional oral em pacientes hospitalizados, analisando parâmetros antropométricos no momento da admissão e da alta. Trata-se de um estudo retrospectivo, descritivo e observacional, realizado em um hospital de média complexidade na cidade de Santa Maria, RS, entre agosto de 2024 e março de 2025. Foram analisados prontuários de pacientes adultos e idosos em risco nutricional ou com diagnóstico de desnutrição. As medidas de peso, índice de massa corporal (IMC), circunferência do braço (CB) e circunferência da panturrilha (CP) foram comparadas antes e após a intervenção nutricional. A amostra foi composta por 34 pacientes, majoritariamente do sexo masculino (73,5%) e com média de idade de 63,5 anos. Após a suplementação, observou-se discreto aumento, porém significativo, do IMC (de 19,1±3,7 para 19,5±3,9; p=0,003), enquanto peso, CB e CP permaneceram estáveis. Apesar da ausência de alterações relevantes na classificação nutricional, a manutenção dos parâmetros antropométricos indica efeito positivo

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da suplementação nutricional. Os resultados reforçam a importância da triagem precoce, da terapia nutricional individualizada e da utilização de suplementos hiperproteicos e hipercalóricos como estratégia para prevenir o agravamento da desnutrição hospitalar, especialmente em pacientes idosos. Conclui-se que há necessidade de estudos adicionais para aprimorar o cuidado nutricional em ambiente hospitalar.

Palavras-chave: *Diagnóstico Nutricional; Desnutrição Proteico-Calórica; Suplementação Nutricional.*

INTRODUCTION

Hospital malnutrition, although frequently overlooked, represents a significant clinical challenge, serving as an independent risk factor for clinical deterioration, increased morbidity and mortality, and prolonged hospital stay. It is a multifactorial condition with a high prevalence among hospitalized patients, particularly older adults and those presenting with chronic diseases or critical illness. It is estimated that 20% to 50% of hospitalized adults suffer from some degree of malnutrition, a condition that can worsen during hospitalization (Toledo *et al*., 2023; Correia *et al*., 2017).

The consequences of malnutrition extend beyond weight loss and include major changes in body composition, impaired immune response, impaired wound healing, and a higher risk of infections and pressure ulcers, in addition to increased length of hospital stay and healthcare costs (Lima, 2016; Barbosa *et al.,* 2022). In older patients, inadequate dietary intake is one of the primary causes of malnutrition, influenced by physical, emotional, social, and cultural factors (Patel *et al*., 2008). In many cases, hospital food is also cited as a limiting factor, whether due to monotony, lack of palatability, or inadequacy regarding patient preferences and needs (Ferreira *et al*., 2013).

Therefore, early and effective nutritional management is essential, utilizing strategies that ensure adequate energy and protein intake. Among these strategies, oral nutritional supplementation (ONS) stands out as a cost-effective approach associated with improvements in nutritional status, muscle strength, and quality of life, as well as reductions in clinical complications and hospital mortality (Deutz *et al.,* 2020; Elia *et al.,* 2016).

The implementation of adequate supplementation, particularly with high-protein formulas, has proved essential for the nutritional and functional recovery of hospitalized patients (Huynh *et al*., 2014); thus, anthropometric assessment is key to guiding and adjusting interventions, enabling practical, accurate, and individualized monitoring of nutritional status through objective measures. Methods such as Body Mass Index (BMI), calf circumference (CC), and mid-upper arm circumference (MUAC) are fundamental tools for identifying nutritional risk and assessing intervention efficacy (Mussoi, 2023).

Against this background, the present study aimed to evaluate the impact of ONS on hospitalized patients by analyzing their nutritional status throughout hospitalization using anthropometric data.

METHODS

STUDY DESIGN AND SETTING

This observational, descriptive, and retrospective study was conducted at a secondary care hospital fully affiliated with the Brazilian Unified Health System (SUS), located in the central region of Rio Grande do Sul. The study was based exclusively on the review of medical records of adult and older adult patients of both sexes admitted to the clinical inpatient ward between August 2024 and March 2025. All collected data, including nutritional screening, anthropometry, dietary intake assessment, and indication for supplementationl, were part of the routine clinical practices of the lead clinical dietitian and resident dietitians, and were duly documented in the progress notes of the medical records.

ELIGIBILITY CRITERIA

Patients who had a dietary intake of less than 60% of their daily requirements, assessed using the Dietary Intake Assessment Toor, or who were classified as at nutritional risk (NRS-2002 score >3) were included in the study. Additional inclusion criteria were a body mass index (BMI) below 22kg/m² for patients over 60 years of age and below 19kg/m² for adults aged 60 and under, or muscle mass depletion as assessed by mid-upper arm circumference (MUAC) at the initial anthropometric evaluation. Patients prescribed high-protein, high-calorie oral nutritional supplements and who demonstrated adherence to supplementation were included. Those hospitalized for less than 48 hours were excluded.

NUTRITIONAL INTERVENTION AND SUPPLEMENTATION

Three types of commercial liquid oral nutritional supplements, standardized by the institution, were used in this study. All options feature high energy and protein density, and are lactose-free and gluten-free; one formulation is indicated for sugar-restricted diets, and another is formulated to support wound healing. They are supplied in ready-to-drink 200 mL bottles and recommended for patients requiring specialized nutritional support to assist in maintaining or recovering their nutritional status. Supplement prescription and patient acceptance were evaluated and documented daily in the medical records by the nutrition team.

ANTHROPOMETRIC ASSESSMENT

In the anthropometric assessment, weight, height, MUAC (Lohman *et al.,* 1988), CC (Barbosa *et al.,* 2016), and knee height (KH) were recorded. BMI was calculated by dividing weight (kg) by height squared (m^2), expressed in kg/m^2. Results were classified according to the World Health Organization (1997) criteria for adults, whereas the Lipschitz (1994) classification was used for older patients. For patients whose weight and height could not be measured directly, Chumlea's equations (1988) were applied to estimate these values. MUAC adequacy was determined using the formula proposed by Blackburn and Thornton (1979), using the 50th percentile defined by Frisancho (1990) for individuals up to 75 years of age; for patients over 75 years of age, classification followed the guidelines of Burr and Phillips (1984).

STATISTICAL ANALYSIS

To describe the sample characteristics and anthropometric variables, descriptive statistical analysis was performed. Categorical variables were presented as absolute frequencies and percentages, whereas quantitative variables were described using measures of central tendency and dispersion, expressed as mean and standard deviation. The normality of weight, BMI, MUAC, and CC variables before and after the nutritional intervention was verified using the Shapiro-Wilk test. A paired-samples t-test was used to compare normal distributed variables between time points (pre- and post-intervention). Associations between qualitative variables were analyzed using the chi-square test. A significance level of 5% ($p < 0,05$) was adopted, and all statistical analyses were performed using IBM SPSS Statistics® software, version 25.0.

This study was approved by the Research Ethics Committee under opinion number 7.469.522 on March 16, 2025.

RESULTS

SAMPLE CHARACTERIZATION

The sample comprised 34 patients, the majority of whom were male (73.5%). The mean age was 63.5 years (63,5±18,4). Regarding nutritional risk, 82.3% of the patients were found to be at risk, whereas 17.7% presented no nutritional risk.

ANTHROPOMETRIC ASSESSMENT

The results showed a subtle, yet statistically significant, increase in mean BMI following the intervention (from 19,1±3,7 to 19,5±3,9; p=0,003). Weight showed a slight incremente (from 51,2±10,7 kg to 51,8±11,3 kg), but without statistical significance (p=0,188). Regarding nutritional status, 67.6% of patients remained classified as underweight and 32.4% as eutrophic, both before and after the evaluation period (Table 1).

MUAC and CC measurements showed no significant differences between pre- and post-intervention time points. In the CC assessment, 61.7% of patients presented muscle depletion, whereas 38.2% did not. According to MUAC, 5.8% showed depletion and 94.1% did not (Table 1).

Table 1 - Characterization of anthropometry.

Variables	Results (mean ± SD)	p
Weight (Kg)		
Before	51,2±10,7	0,188
After	51,8±11,3	
Height (m)	1,63±0,11	-
BMI		
Before	19,1±3,7	0,003
After	19,5±3,9	
MUAC		
Before	23±3,1	0,139
After	23,3±3,1	
CC		
Before	27,7±3,6	0,328
After	27,5±3,6	
Nutritional Status 1 n (%)		
Underweight	23 (67,6%)	-
Eutrophic	11 (32,4%)	
Nutritional Status 2 n (%)		
Underweight	23 (67,6%)	-
Eutrophic	11 (32,4%)	

Key: 1: nutritional status before intervention; 2: nutritional status after intervention.
Source: Authors (2026)

NUTRITIONAL STATUS AND DIAGNOSES

Among the predominant diagnoses, 47.1% were patients with pulmonary diseases, 17.6% were oncological, and 35.3% were classified under other diagnoses.

No significant association was found between diagnosis and nutritional status (p=0.216). However, underweight was found to be more prevalent in pulmonology patients (81.3%) and oncological patients (66.7%), whereas eutrophy predominated in patients classified as “others” (50%) (Table 2)

Table 2 - Correlation between diagnosis and nutritional status.

Diagnosis	Nutritional status			p
	Underweight	Eutrophy	Total	
Pulm	13 (81,3%)	3 (18,7%)	16 (100%)	
Onco	4 (66,7%)	2 (33,3%)	6 (100%)	0,216
Other	6 (50%)	6 (50%)	12 (100%)	

Key: Pulm: Pulmonary diseases; Onco: Oncological diseases.
Source: Authors (2026).

Considering only older adults (≥60 anos; n=23), presented with underweight and 26.1% were eutrophic. Among the diagnoses, 43.5% were pulmonary, 21.7% oncological, and 34.8% other.

Table 3 - Correlation between diagnosis and nutritional status in older adults.

Diagnosis	Nutritional status			p
	Underweight	Eutrophy	Total	
Pulm	9 (90%)	1 (10%)	10 (100%)	
Onco	4 (80%)	1 (20%)	5 (100%)	0,149
Other	4 (50%)	4 (50%)	8 (100%)	

Key: Pulm: Pulmonary diseases; Onco: Oncological diseases.
Source: Authors (2026).

As with the total sample, no significant association was found between diagnosis and nutritional status (p=0.149). However, it was observed that among older adults, the prevalence of underweight was even more pronounced in pulmonary (90%) and oncological (80%) diagnoses.

SUPPLEMENTATION USED

Regarding the type of supplement, most patients used a high-protein supplement, with 47.1% using it once daily and 38.2% twice daily. Other types of supplements were less frequently used, such as diabetes-specific formulas 1x/day (5.9%) and 2x/day (5.9%), and wound-healing formulas (2.9%).

CLINICAL AND NUTRITIONAL CHARACTERISTICS OF THE STUDY POPULATION

It is also worth noting that this is a vulnerable population, owing to advanced age and the presence of chronic conditions. Given this scenario, it is necessary to implement actions to reduce malnutrition rates in the hospital setting, aimed at identifying potential nutritional risks and providing appropriate medical nutrition therapy. The lack of statistical significance may be related to the small sample size of the study, reinforcing the need for further research in this field. This is an original study conducted in a low- and medium-complexity hospital in the Central-West region of Rio Grande do Sul, where there was previously no estimate of nutritional alterations among hospitalized patients.

DISCUSSION

In the present study, more than 80% of the evaluated patients were at nutritional risk according to the NRS-2002 screening tool, highlighting the importance of early screening and the implementation of personalized nutritional interventions from the time of hospital admission (Figueira *et al.,* 2023). Furthermore, data presented by the British Association for Parenteral and Enteral Nutrition (BAPEN) from the "Nutritional Screening Week" in 2007, 2008, and 2010 indicated that one in three patients arrives at the hospital presenting some degree of nutritional risk, demonstrating that this scenario persists to the present day (Toledo *et al*., 2018).

The studied sample was predominantly male, with a mean age over 60 years, reinforcing the vulnerability of this demographic profile to nutritional risk. In line with this, a systematic review examining the status of malnutrition in hospitals across twelve Latin American countries, encompassing approximately 30,000 patients, observed a malnutrition prevalence ranging from 40% to 60% upon hospital admission, which further increased during the period of hospitalization (Correia; Perman; Waitzberg, 2017). Additionally, a study on sarcopenia highlighted its growing relevance as a global public health issue, estimating that the condition may affect up to 50% of individuals aged 80 years or older (Yuan, 2023).

This scenario is confirmed by a systematic review conducted in 2020, which analyzed 15 studies and showed that both previously well-nourished patients and those already vulnerable can experience a deterioration in nutritional status during hospitalization, with rates ranging from 10% to 65%. Among the main factors contributing to this decline are fasting or meal interruptions for procedures, low meal acceptance, disease- or treatment-related symptoms, chewing difficulties, poor appetite, and the low priority given to nutrition in clinical practice (Cass *et al.,* 2022).

In the anthropometric assessment, body weight showed no significant changes throughout follow-up, remaining stable during hospitalization. This finding is relevant, given that the literature describes weight loss as a common outcome in hospitalized patients, particularly those in severe clinical conditions (Moraes *et al.,* 2023). Therefore, weight maintenance can be interpreted as a positive effect of the nutritional intervention. Furthermore, a slight yet statistically significant increase in BMI was observed, suggesting that nutritional therapy contributed to stabilizing nutritional status. Nevertheless, the classifications of underweight and eutrophia, as well as mid-upper arm and calf circumferences, remained unchanged, reinforcing the chronic nature of nutritional impairment in this patient profile.

Regarding the relationship between diagnosis and nutritional status, no significant association was observed. However, a high prevalence of underweight was identified in patients with pulmonary diseases (81.3%) and oncological conditions (66.7%), corroborating studies that point to a higher susceptibility of these groups to malnutrition. According to the literature, the prevalence of malnutrition

in patients with Chronic Obstructive Pulmonary Disease (COPD) is highly variable, ranging from 17% to 47.2%, owing to differences in the patient populations evaluated and the diagnostic criteria used; notably, the clinical implications of poor nutritional status in individuals with COPD are closely linked to the pathophysiology of the disease, which frequently leads to an energy imbalance with a hypercatabolic state driven by low-grade systemic inflammation, tissue hypoxia, and ultimately muscle atrophy and wasting (Di Raimondo *et al.,* 2024). In oncology patients, an integrative review covering the period from 2012 to 2019 demonstrated that malnutrition frequently accompanies patients undergoing cancer treatment, primarily due to chemotherapy and radiotherapy, which often cause gastrointestinal side effects that lead to reduced oral intake (Freitas, 2020).

Among the elderly, nearly three-quarters presented with underweight, with the association with pulmonary disease and oncological diagnoses being even more prominent (90% and 80%, respectively). Although statistical significance was not reached, these results suggest that advanced age exacerbates nutritional vulnerability in debilitating clinical conditions. These findings align with the literature, which links malnutrition in hospitalized older adults to higher mortality rates, prolonged length of stay, and increased healthcare costs (Baumgartner, 2021; Barbosa *et al.,* 2022).

Regarding supplementation, a higher utilization of high-protein supplements was observed, predominantly administered in a single daily dose. This practice is likely associated with efforts to minimize muscle mass loss, maintain dietary intake within recommended daily allowances, and optimize clinical prognosis. This approach is supported by international guidelines, which indicate oral nutritional supplements (ONS) as the first line of choice for patients with insufficient intake (NICE, 2006; Cawood *et al.,* 2012). Furthermore, studies show that ONS is associated with shorter lengths of hospital stay, reduced complication rates, functional improvement, and a positive cost-effectiveness ratio (Elia *et al*., 2016; Gomes *et al.,* 2019; Huynh *et al.,* 2014).

Overall, the findings of this study suggest that although nutritional intervention promoted a slight improvement in indicators such as BMI and weight maintenance during hospitalization, the high prevalence of underweight reinforces the complexity of nutritional care in this patient population. This scenario is particularly critical in older adults, especially those diagnosed with pulmonary diseases and oncological conditions, who were shown to be more susceptible to malnutrition and require individualized and intensified nutritional support strategies. Indeed, in a study involving malnourished hospitalized patients with COPD, high-protein supplementation was associated with a reduction in mortality risk, as well as improvements in body weight and nutritional biomarkers over a 90-day period following hospital discharge. This analysis highlighted the importance of early identification of nutritional risk and the administration of high-protein ONS in malnourished older patients with COPD during hospitalization and continuing after hospital discharge (Deutz, 2021).

Therefore, hospital malnutrition remains a significant challenge, largely due to the absence of standardized nutritional screening protocols in many healthcare services. When this assessment

does not occur systematically, patients at nutritional risk fail to receive timely interventions, which can accelerate clinical deterioration. The literature reinforces that early identification and structured nutritional follow-up should be part of routine care across all institutions (Doganay *et al.,* 2025).

Despite the results obtained, several limitations should be considered. The small sample size may have influenced the significance of the findings, and the absence of a control group precludes direct comparison between individuals exposed and unexposed to the intervention. Furthermore, it should be noted that the assessment was based exclusively on anthropometric markers, with no inclusion of other parameters, such as biochemical or clinical indicators, which could have complemented the analysis of nutritional status and strengthened the study's conclusions.

CONCLUSION

It is concluded that although no statistical significance was observed when comparing initial and final body weight during hospitalization, weight maintenance and stability in circumferences were identified, along with a slight improvement in patient BMI. Thus, it is suggested that future research incorporate larger sample sizes, control groups, and multiple assessment methods. Furthermore, the adoption of protocols for early screening, as well as anthropometric and dietary assessment, becomes essential to ensure appropriate supplementation when necessary. Consequently, these elements represent fundamental pillars for improving clinical prognosis and the quality of nutritional care in hospitalized patients.

REFERENCES

BARBOSA, Juliana S.; SOUZA, Márcia F. C.; COSTA, Jamille O.; ALVES, Luciana Vieira S.; OLIVEIRA, Larissa M. S. M.; ALMEIDA, Rebeca R.; OLIVEIRA, Victor B.; PEREIRA, Larissa M. C.; ROCHA, Raysa M. S.; COSTA, Ingrid M. B. B. C. Assessment of malnutrition in heart failure and its relationship with clinical problems in Brazilian health services. **International Journal of Environmental Research and Public Health**, v. 19, n. 16, p. 10090, 2022. Available at: http://dx.doi.org/10.3390/ijerph191610090. Acsessed on: 1 set. 2024.

BAUMGARTNER, A.; PACHNIS, D.; PARRA, L.; HERSBERGER, L.; BARGETZI, A.; BARGETZI, L.; KAEGI-BRAUN, N.; TRIBOLET, P.; GOMES, F.; HOESS, C.; PAVLICEK, V.; BILZ, S.; SIGRIST, S.; BRAENDLE, M.; HENZEN, C.; THOMANN, R.; RUTISHAUSER, J.; AUJESKY, D.; RODONDI, N.; DONZÉ, J.; STANGA, Z.; MUELLER, B.; SCHUETZ, P. The impact of nutritional support on malnourished inpatients with aging-related vulnerability**. Nutrition**, v. 89, p. 111279, set. 2021. DOI: 10.1016/j.nut.2021.111279. Available at: https://pubmed.ncbi.nlm.nih.gov/34090212/. Accessed on: 13 out. 2025.

BLACKBURN, G. L.; THORNTON, P. A. Nutritional assessment of the hospitalized patients. **Medical Clinics of North America**, v. 63, n. 5, p. 1103-1115, 1979.

BURR, M. L.; PHILLIPS, M. K. Anthropometric norms in the elderly. **British Journal of Nutrition**, v. 51, p. 165-169, 1984.

CASS, A.; CHARLTON, K. Prevalência de desnutrição adquirida no hospital e determinantes modificáveis da deterioração nutricional durante internações hospitalares: uma revisão sistemática das evidências. **Journal of Human Nutrition and Dietetics**, v. 35, p. 1043-1058, 2022. Available at: https://doi.org/10.1111/jhn.13009. Accessed on: 22 nov. 2025.

CAWOOD, A. L.; ELIA, M.; STRATTON, R. J. Systematic review and meta-analysis of the effects of high protein oral nutritional supplements. **Ageing Research Reviews**, v. 11, n. 2, p. 278-296, 2012. DOI: 10.1016/j.arr.2011.12.008. Available at: https://pubmed.ncbi.nlm.nih.gov/22212388. Accessed on: 13 out. 2025.

CHUMLEA, W. M. C. Prediction of body weight for non ambulatory elderly from anthropometry. **Journal of American Diet Association**, v. 88, n. 5, p. 564-568, 1988.

CORREIA, M. I. T. D.; PERMAN, M. I.; WAITZBERG, D. L. Hospital malnutrition in Latin America: A systematic review. **Clinical Nutrition**, New York, v. 36, n. 4, p. 958-967, 2017. Available at: https://doi.org/10.1016/j.clnu.2016.06.025. Accessed on: 3 set. 2025.

DEUTZ, Nicolaas E.; ZIEGLER, Thomas R.; MATHESON, Eric M.; MATARESE, Laura E.; TAPPENDEN, Kelly A.; BAGGS, Geraldine E.; NELSON, Jeffrey L.; LUO, Menghua; HEGAZI, Refaat; JONNALAGADDA, Satya S. Reduced mortality risk in malnourished hospitalized older adult patients with COPD treated with a specialized oral nutritional supplement: sub-group analysis of the nourish study. **Clinical Nutrition,** v. 40, n. 3, p. 1388-1395, mar. 2021. Available at: http://dx.doi.org/10.1016/j.clnu.2020.08.031. Accessed on: 2 nov. 2024.

DI RAIMONDO, D.; PIRERA, E.; PINTUS, C.; DE ROSA, R.; PROFITA, M.; MUSIARI, G.; SISCARO, G.; TUTTOLONDOMONDO, A. The impact of malnutrition on chronic obstructive pulmonary disease (COPD) outcomes: the predictive value of the Mini Nutritional Assessment (MNA) versus acute exacerbations in patients with highly complex COPD and its clinical and prognostic implications. **Nutrients**, v. 16, n. 14, p. 2303, 2024. DOI: 10.3390/nu16142303. Available at: https://iris.unipa.it/retrieve/9acfebd2-8a5d-4100-92ac-e1ec9942db21/Nutrients%20PIrera%202024%20The%20Impact%20of%20Malnutrition%20on%20Chronic%20Obstructive%20Pulmonary%20Disease%20.pd. Accessed on: 13 out. 2025.

DOGANAY, M.; HALIL, M. G.; UYAR, M. et al. Prevalência do risco de desnutrição em pacientes hospitalizados: um amplo estudo nacional**. Journal of Health, Population and Nutrition**, v. 44, art. 137, 2025. Available at: https://doi.org/10.1186/s41043-025-00891-6. Accessed on: 22 nov. 2025.

ELIA, M.; NORMAND, C.; NORMAN, K.; LAVIANO, A. A systematic review of the cost and cost effectiveness of using standard oral nutritional supplements in the hospital setting. **Clinical Nutrition**, v. 35, n. 2, p. 370-380, 2016. Available at: http://dx.doi.org/10.1016/j.clnu.2015.05.010. Accessed on: 5 set. 2024.

FERREIRA, D.; GUIMARÃES, T. G.; MARCADENTI, A. Aceitação de dietas hospitalares e estado nutricional entre pacientes com câncer. **Einstein,** São Paulo, v. 11, n. 1, p. 41-46, 2013.

FIGUEIRA, Raquel; PENA, Marya; RADAELLI, Lidiane; LIBARDI, Manoela; PANI, Virgília; COSTA, André; VIANA, Mirelle. Avaliação do estado nutricional e presença de desnutrição em pacientes hospitalizados. **BRASPEN Journal**, v. 38, n. 1, 2023. Available at: http://dx.doi.org/10.37111/braspenj.2023.38.1.07. Accessed on: 3 set. 2025.

FREITAS, Cristian Barbosa et al. Prevalence of malnutrition in oncological patients. **Research, Society and Development**, v. 9, n. 4, 2020. Available at: https://rsdjournal.org/rsd/article/view/3019/2313. Accessed on: 4 set. 2025.

GOMES, Filomena; BAUMGARTNER, Annic; BOUNOURE, Lisa; BALLY, Martina; DEUTZ, Nicolaas E.; GREENWALD, Jeffrey L.; STANGA, Zeno; MUELLER, Beat; SCHUETZ, Philipp. Association of Nutritional Support With Clinical Outcomes Among Medical Inpatients Who Are Malnourished or at Nutritional Risk. **JAMA Network Open**, v. 2, n. 11, p. e1915138, 2019. Available at: http://dx.doi.org/10.1001/jamanetworkopen.2019.15138. Accessed on: 21 ago. 2024.

HUYNH, D. T. T.; DEVITT, A. A.; PAULE, C. L.; REDDY, B. R.; MARATHE, P.; HEGAZI, R. A.; ROSALES, F. J. Effects of oral nutritional supplementation in the management of malnutrition in hospital and post-hospital discharged patients in India: a randomised, open-label, controlled trial**. Journal of Human Nutrition and Dietetics**, v. 28, n. 4, p. 331-343, 2014. Available at: http://dx.doi.org/10.1111/jhn.12241. Accessed on: 15 ago. 2024.

LIMA, Luciana Moreira. **Exames bioquímicos**: guia prático para o clínico. 2. ed. Rio de Janeiro: Rubio, 2016.

LIPSCHITZ, D. A. Screening for nutritional status in the elderly. **Primary Care,** v. 21, n. 1, p. 55-67, 1994.

LOHMAN, T. G.; ROCHE, A. F.; MARTORELL, R. **Anthropometric Standardization Reference Manual**. Champaign, IL: Human Kinetics Books, 1988.

MORAES, Giselle V.; ROCHA, Naruna P.; MARTINS, Jussara dos Anjos; RAMOS, Selma P.; XAVIER, Maria Cristina C.; XAVIER, Tamires Cristina P.; ARAÚJO, Juliana Gomes de Sousa. Prevalência de desnutrição em pacientes internados em hospital público e sua associação com permanência hospitalar e mortalidade. **Revista Interdisciplinar de Estudos em Saúde**, v. 12, n. 1, 2023. Available at: https://doi.org/10.33362/ries.v12i1.2988. Accessed on: 6 nov. 2024.

MUSSOI, Thiago Durand. **Avaliação nutricional na prática clínica**: da gestação ao envelhecimento. Rio de Janeiro: Guanabara Koogan, 2023. E-book. ISBN 9788527739412. Available at: https://integrada.minhabiblioteca.com.br/#/books/9788527739412.

NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE (NICE). **Nutrition support in adults:** Evidence Update August 2013. Londres: NICE, 2013. Evidence Update, n. 46. Available at: https://www.ncbi.nlm.nih.gov/books/NBK551955. Accessed on: 13 out. 2025.

TOLEDO, Diogo Oliveira et al. Campanha "Diga não à desnutrição": 11 passos importantes para combater a desnutrição hospitalar. **BRASPEN Journal**, v. 33, n. 1, p. 86-100, 2023. Available at: https://braspenjournal.org/article/63e28d4aa9539528341f30a5. Accessed on: 2 set. 2025.

YUAN, Shuai; LARSSON, Susanna C. Epidemiology of sarcopenia: Prevalence, risk factors, and consequences**. Metabolism,** v. 144, p. 155533, jul. 2023. DOI: 10.1016/j.metabol.2023.155533. Available at: https://pubmed.ncbi.nlm.nih.gov/36907247. Accessed on: 13 out. 2025.