# Adapted Nutripal Screening and Overall Survival in Cancer Patients in Palliative Care

https://doi.org/10.32635/2176-9745.RBC.2026v72n2.5648EN

## *Triagem Nutripal Adaptada e Sobrevida Global em Pacientes com Câncer em Cuidados Paliativos*

## Tamizaje Nutripal Adaptado y Supervivencia Global en Pacientes con Cáncer en Cuidados Paliativos

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ABSTRACT

**Introduction:** Nutritional risk is common among cancer patients receiving palliative care and is associated with reduced life expectancy. The Nutripal screening tool is specifically designed for this population, integrating the patient-generated subjective global assessment (PG-SGA) and the Glasgow prognostic score (GPS). **Objective:** To analyze the applicability of an adapted version of Nutripal, excluding albumin, and to assess its association with overall survival. **Methods:** This retrospective cohort study was conducted at a Cancer Center between July 2023 and July 2024 and included patients receiving palliative care. The Nutripal screening tool was applied in its full version (grades 1 to 4) and in an adapted version (grades 1 to 3). The primary outcome was overall survival at 180 days. **Results:** A total of 200 patients were included, most of whom were at nutritional risk (79%) and had a diagnosis of severe malnutrition (76%). PG-SGA scores ≥9 were not associated with mortality. Patients classified in the highest risk category, in both the full and adapted versions of Nutripal, had a higher risk of mortality at 180 days (p=0.02; HR = 1.57; 95% CI: 1.04–2.36), regardless of age, oncological diagnosis, and Palliative Performance Scale (PPS) results, with moderate and similar discrimination between versions (C-statistic = 0.651 for the full version and 0.637 for the adapted version). **Conclusion:** The adapted Nutripal screening tool proved applicable for identifying nutritional risk and demonstrated the ability to predict reduced overall survival.

**Key words:** Nutrition Assessment; Screening; Palliative Care; Survival Analysis; Prognosis.

RESUMO

**Introdução:** O risco nutricional é frequente em pacientes com câncer em cuidados paliativos e está associado à menor expectativa de vida. A triagem Nutripal é uma ferramenta específica para essa população, integrando a avaliação subjetiva global produzida pelo paciente (ASG-PPP) e o escore de prognóstico de Glasgow (EPG). **Objetivo:** Analisar a aplicabilidade de uma versão adaptada da Nutripal, sem o uso da albumina, e verificar sua associação com a sobrevida global. **Método:** Estudo de coorte restrospectiva, realizado em um *Cancer Center* entre julho de 2023 e julho de 2024, incluindo pacientes em cuidados paliativos. A triagem Nutripal foi aplicada em sua versão completa (graus 1 a 4) e adaptada (graus 1 a 3). O desfecho primário foi analisar a sobrevida global em 180 dias. **Resultados:** Foram incluídos 200 pacientes, a maioria com risco nutricional (79%) e diagnóstico de desnutrição grave (76%). Pontuações ≥9 na ASG-PPP não se associaram à mortalidade. Pacientes classificados no maior grau de risco, tanto na versão completa quanto na adaptada da Nutripal, apresentaram maior risco de mortalidade em 180 dias (*p*=0,02; HR=1,57; IC 95%: 1,04–2,36), independentemente da idade, diagnóstico oncológico e resultados de *Performance Palliative Scale* (PPS), com discriminação moderada e semelhante entre as versões (estatística C=0,651 na versão completa e 0,637 na adaptada). **Conclusão:** A triagem Nutripal adaptada mostrou-se aplicável na identificação do risco nutricional, com capacidade de predizer menor sobrevida global.

**Palavras-chave:** Avaliação Nutricional; Triagem; Cuidados Paliativos; Análise de Sobrevida; Prognóstico.

RESUMEN

**Introducción:** El riesgo nutricional es frecuente en pacientes con cáncer en cuidados paliativos y está asociado con una menor esperanza de vida. El tamizaje Nutripal es una herramienta específica para esta población, que integra la valoración global subjetiva generada por el paciente (VGS-GP) y el puntaje pronóstico de Glasgow (GPS). **Objetivo:** Analizar la aplicabilidad de una versión adaptada de Nutripal, sin el uso de albúmina, y verificar su asociación con la supervivencia global. **Método:** Estudio de cohorte retrospectiva, realizado en un *Cancer Center* entre julio de 2023 y julio de 2024, que incluyó pacientes en cuidados paliativos. El tamizaje Nutripal se aplicó en su versión completa (grados 1 a 4) y en su versión adaptada (grados 1 a 3). El desenlace primario fue analizar la supervivencia global a 180 días. **Resultados:** Se incluyeron 200 pacientes, la mayoría con riesgo nutricional (79%) y diagnóstico de desnutrición grave (76%). Puntuaciones 9 o más en la VGS-GP no se asociaron con la mortalidad. Los pacientes clasificados en el mayor grado de riesgo, tanto en la versión completa como en la adaptada de Nutripal, presentaron mayor riesgo de mortalidad a 180 días (*p*=0,02; HR = 1,57; IC 95%: 1,04–2,36), independientemente de la edad, diagnóstico oncológico y resultados de la *Palliative Performance Scale* (PPS), con discriminación moderada y similar entre las versiones (estadístico C igual a 0,651 en la versión completa y 0,637 en la adaptada). **Conclusión:** El tamizaje Nutripal adaptado demostró ser aplicable para la identificación del riesgo nutricional, con capacidad para predecir una menor supervivencia global.

**Palabras clave:** Evaluación Nutricional; Cribado; Cuidados Paliativos; Análisis de Supervivencia; Pronóstico.

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## INTRODUCTION

Palliative care (PC) is a therapeutic approach aimed at improving the quality of life of patients and their families[1]. Around 57 million people are estimated to need PC due to some health condition[2]. Among the chronic non-communicable diseases (CNCDs), cancer is the pathology that requires this type of care the most[3]. Both the development of neoplasms and antineoplastic treatments may cause changes that compromise food intake, favoring nutritional risk and/or malnutrition[4].

Nutritional risk is defined as the increased probability of morbidity and mortality associated with nutritional status[5]. Screening is the initial step in care, enabling early identification of this risk and guidance on appropriate nutritional intervention[6]. In the context of PC, a significant proportion of patients presents high nutritional risk associated with lower life expectancy, demonstrating the importance of prognostic assessment for more assertive nutritional care[7].

Nutripal is a specific screening tool for patients in palliative care, capable of classifying nutritional risk grades simply and at low cost[8]. It integrates the patient-generated subjective global assessment (PG-SGA) and the Glasgow prognostic score (GPS). The inflammatory response is a relevant criterion to identify malnutrition associated with cancer, being used as a prognostic marker in patients with incurable cancer[9]. However, in clinical practice, the albumin test is not always available at every institution, limiting the use of the tool as intended. With all that considered, the objective of this study is to analyze the applicability of the adapted version of Nutripal screening without albumin and assess its association with overall survival.

## METHOD

Retrospective cohort study conducted with cancer patients in PC hospitalized between July 2023 and July 2024 at a Cancer Center located in the State of São Paulo. Data was obtained by reviewing electronic medical records chosen by convenience sampling. The study included patients with a cancer diagnosis, from both sexes, aged 19 or older, followed up by the PC team during hospitalization, and who had a PG-SGA record. The study excluded individuals with no CRP and albumin lab results during hospitalization, and those who did not consent to participate.

Regarding functionality, patients were assessed using the Palliative Performance Scale (PPS), obtained through the PC team's assessment and evolution on the closest date of the PG-SGA application. PC was considered early when the PPS was higher than 60%, complementary when between 40 and 60%, and predominant when inferior to 40%[10]. The functional profile assessment of patients with cancer in PC is relevant, as it reflects prognosis and helps define the therapeutic approach according to the clinical situation, contributing to maintaining quality of life[11-13]. Functional assessment tools, such as PPS, provide complementary information to PG-SGA and help guide the most appropriate nutritional care[12].

Nutritional variables were collected from the PG-SGA application, the gold-standard tool for nutritional assessment in oncology[13]. Additionally, the Nutripal[8] tool was applied in its original version, classifying patients in nutritional risk grades from 1 to 4, representing progression from lower to higher risk[8]. Patients with a PG-SGA score of ≥9 were evaluated for inflammation using CRP and albumin values from the GPS[14], considering results obtained within a week of the subjective assessment application.

Aiming to make the tool applicable in the absence of albumin, we used an adapted version of Nutripal. In that case, patients with a PG-SGA score of <9 were classified as grade 1, while those with a score ≥9 were categorized in grade 2 when CRP ≤10 mg/dL and grade 3 when CRP >10 mg/dL.

Overall survival was assessed on both versions of the tool, considering the interval (in days) between the date of PG-SGA application and death. The cutoff adopted was 180 days[15] and all living patients after that period were censored in the survival analysis.

Initially, a descriptive variable analysis was conducted. The qualitative variables were presented in absolute (n) and relative (%) frequencies, while the quantitative variables were described through mean, standard deviation, median, minimum, and maximum values. For the association between qualitative variables, the chi-square test was used[16] or, when needed, Fisher's exact test[17]. The comparison between quantitative variables according to groups was done using Student's *t* test[18] or ANOVA[19], when appropriate, or non-parametric alternatives, when the assumption of normality was not met.

The survival analysis was conducted using the Kaplan-Meier method and group comparison through the log rank test[20]. Cox's proportional hazards model was used to verify the hazard ratio (HR) and the 95% confidence interval (CI) to analyze overall survival within 180 days for each nutritional risk grade, in both versions of the tool. Two models were produced: Complete Nutripal and adapted Nutripal, both adjusted by age, cancer diagnosis, and PPS, for investigation of the possible confounding effect. Variables with missing data were considered in regression analyses. The discriminative ability of the adjusted models

was estimated through Harrell's C statistic, calculated from the final models' predictor linear score. The significance level adopted was 5%. The analysis was conducted using IBM SPSS[21] software, version 29.

This study has been approved by the Research Ethics Committee, report number 7,042,811 (CAAE (submission for ethical review): 82290824,4,0000,5432), and a Free and Informed Consent Form (FICF) was applied in person or virtually to the living participants, in compliance with Resolution N. 466/2012[22] by the National Health Council (CNS) on studies involving human beings. For those whose evolution was death, there was no need for consent.

## RESULTS

The study included 200 cancer patients in PC (Figure 1), with an average age of 64 years (±16.2), predominantly female (52%). Of those, 61 patients (30.5%) were diabetic, and 89 (44.5%) had hypertension. Tumors in the upper gastrointestinal tract were the most frequent, corresponding to 31.5% of the sample, as shown in Table 1.

The hospitalizations occurred predominantly in nursing ward beds (76%), with the need for clinical support being the most frequent (70%), especially due to gastrointestinal and respiratory complaints. Most patients died (92%), mainly during the hospitalization period (61.9%). The average hospitalization duration was 18.2 days (Table 1). According to the PPS application, it was observed that most patients needed complementary PC (65.5%), of which 89.3% died; among those, 31.6% presented the highest grade of nutritional risk in both Nutripal versions. Among those classified in grades 3 and 2 (complete and adapted versions, respectively) (47.8%), 82% presented severe malnutrition according to PG-SGA. All the patients with PPS lower than 40% died within 180 days.

Regarding nutritional status, there was broad variation in the PG-SGA score, with a higher prevalence of a score of ≥9 (79%) and classification of severe malnutrition (76%). Moreover, it was verified that most patients presented altered inflammatory patterns according to the GPS, with large dispersion in the CRP values, with 10.1 mg/dL as the mean value (Table 1).

The overall global assessment using the Kaplan-Meier method, based on the PG-SGA score, showed similar results at 180 days. The survival estimate for the analyzed period was 7.1% among individuals with a score of < 9, while those with a score of ≥9 presented an 8.2% estimate. Regarding GPS parameters, it was verified that patients with CRP ≤10 mg/dL and albumin. ≥3.5 mg/dL presented reduced

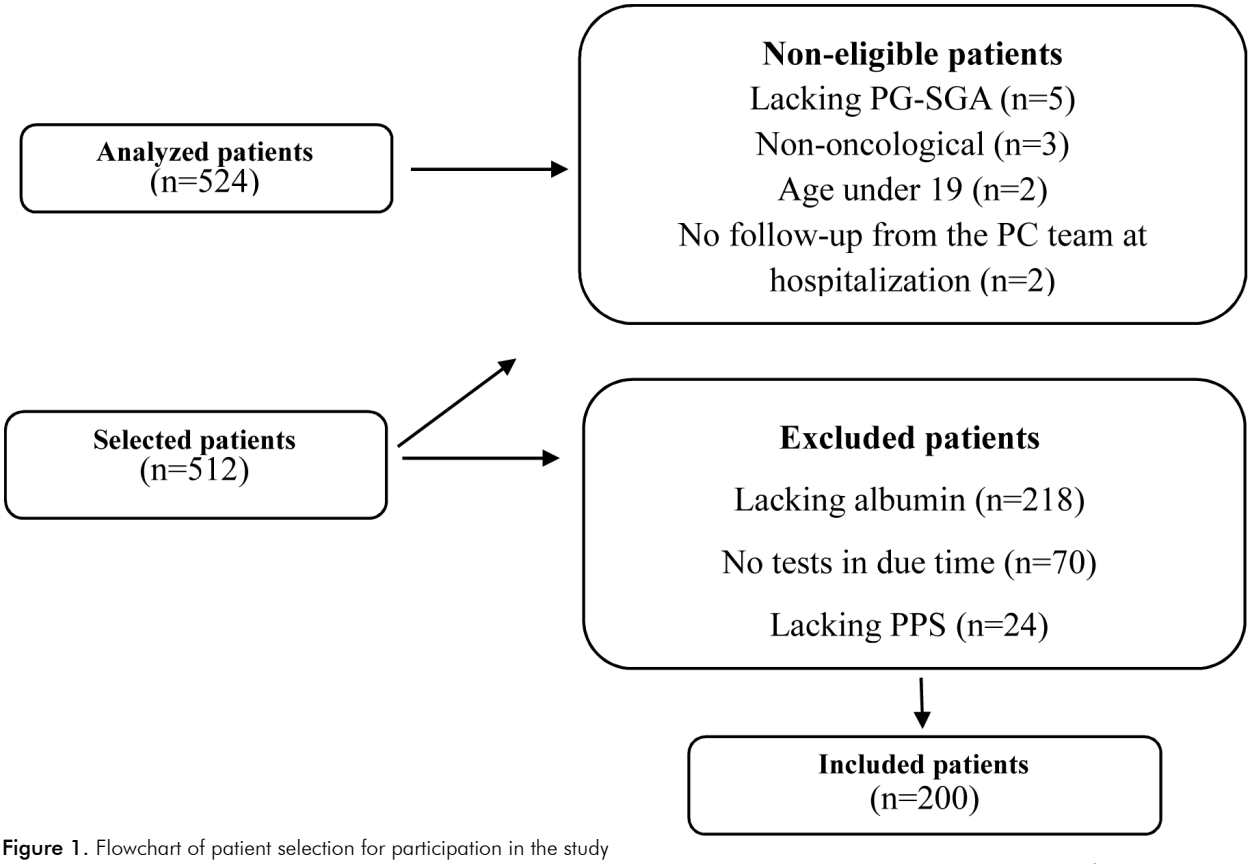


**Figure 1**. Flowchart of patient selection for participation in the study
**Captions:** n: sample size; PG-SGA: patient-generated subjective global assessment; PC: palliative care; PPS: Palliative Performance Scale.

**Table 1.** Clinical, nutritional, and demographic characterization of cancer patients in palliative care

| Variable | Category | n (%) |
|---|---|---|
| **Age (years)** | Min.–Max. | 21.0–98.0 |
| | Mean/Median | 64.0/64.0 |
| **Sex** | Male | 96 (48) |
| | Female | 104 (52) |
| **Oncological diagnosis** | Upper GIT | 63 (31.5) |
| | Hematological | 32 (16) |
| | Intestine and rectum | 28 (14) |
| | Urological | 22 (11) |
| | Chest | 17 (8.5) |
| | Gynecological | 11 (5.5) |
| | Head and neck | 10 (5) |
| | Breast | 9 (4.5) |
| | Skin | 4 (2) |
| | Central nervous system | 4 (2) |
| **Reason for hospitalization** | Clinical support | 140 (70) |
| | Pain control | 26 (13) |
| | Illness progression | 18 (9) |
| | Sepsis | 14 (7) |
| | Oncological treatment | 2 (1) |
| **Hospitalization location** | Hospitalization unit | 152 (76) |
| | Intensive care unit | 48 (24) |
| **Hospitalization days** | Min.–Max. | 3.0–121.0 |
| | Mean/Median | 18.2/14.0 |
| **Comorbidities** | | |
| Diabetes | No | 139 (69.6) |
| | Yes | 61 (30.5) |
| Arterial hypertension | No | 111 (55.5) |
| | Yes | 89 (44.5) |
| **Death** | No | 16 (8) |
| | Yes | 184 (92) |
| | During hospitalization | 114 (61.9) |
| | After hospital discharge | 70 (38.1) |
| **PPS** | Higher than 60% | 23 (11.5) |
| | Between 40 and 60% | 131 (65.5) |
| | Lower than 40% | 46 (23) |
| **GPS** | CRP < 10 and albumin > 3.5 | 6 (3) |
| | CRP > 10 or albumin < 3.5 | 114 (57) |
| | CRP > 10 and albumin < 3.5 | 82 (41) |
| **CRP** | Min.–Max. | 0.0–48.9 |
| | Mean/Median | 10.1/8.2 |
| **Albumin** | Min.–Max. | 0.7–4.0 |
| | Mean/Median | 2.1/2.1 |
| **PG-SGA score** | < 9 points | 42 (21) |
| | ≥ 9 points | 158 (79) |
| | Min.–Max. | 2.0–27.0 |
| | Mean/Median | 15.0/15.0 |
| **PG-SGA classification** | A | 2 (1) |
| | B | 46 (23) |
| | C | 152 (76) |

**Captions:** n: sample size; Min.: minimum; Max.: maximum; GIT: gastrointestinal tract; PPS: Palliative Performance Scale; GPS: Glasgow prognostic score; CRP: C-reactive protein; PG-SGA: patient-generated subjective global assessment.

survival, with a lower estimate at 50 days in the complete version of the instrument. Moreover, it was verified that almost all the patients classified in the highest nutritional risk grade by the complete and adapted Nutripal versions (grades 4 and 3, respectively) died within 180 days (Figures 2 and 3), with a survival estimate of 1.7%.

The Cox regression model presented overall significance for both the complete and adapted versions of the Nutripal scale ($p$=0.001 and $p$<0.001, respectively). Conversely, the ≥9 score in the PG-SGA, when analyzed in isolation, did not associate with mortality within 180 days ($p$=0.97). In the complete tool, the patients classified with grade 4 presented significantly lower overall survival ($p$=0.02) (HR = 1.57; 95% CI: 1.04–2.36) when compared to the other grades. Similar results were observed in the adapted version, in which patients within grade 3 also presented significantly higher mortality ($p$=0.02), with the same relative risk of death (HR=1.57; 95% CI: 1.04– 2.36) (Table 2).

The complete (HR=1.563; 95%CI 1.038–2.353; $p$=0.033) and adapted version of the tool (HR=1.562; 95% CI 1.038–2.353; $p$=0.033) maintained an independent association with mortality within 180 days after age and PPS adjustment. The tumor site did not contribute significantly to any of the models and did not function as a confounder ($p$=0.347). Regarding the discriminative capacity, the C-statistic was 0.651 (95% CI 0.603–0.700) for the complete version model and 0.637 (95% CI 0.589–0.685) for the adapted version, indicating moderate discrimination and similar performance between the two versions.

## DISCUSSION

This study assesses the Nutripal adapted version's screening ability to identify nutritional risk in patients with cancer in PC, considering survival. Overall survival

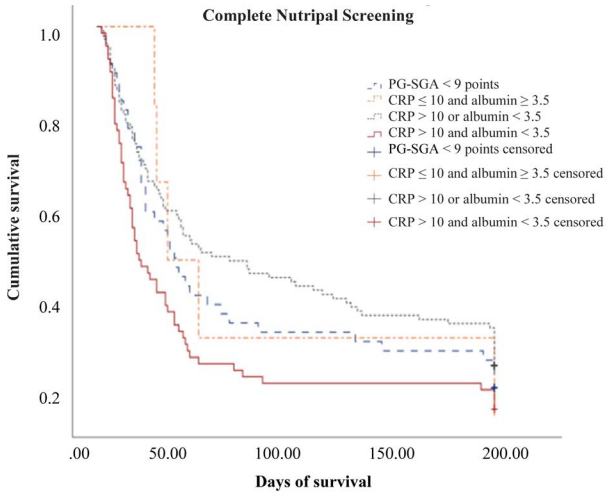


**Figure 2**. Overall survival curve of patients with cancer in palliative care according to the complete Nutripal screening based on the log rank test
**Caption:** CRP: C-reactive protein.

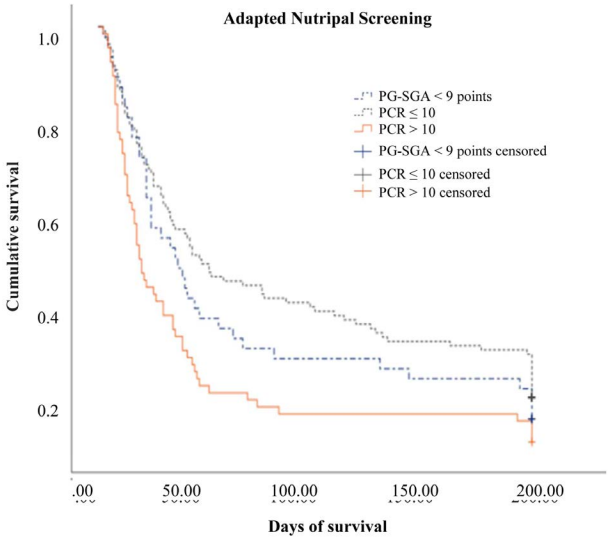


**Figure 3**. Overall survival curve of patients with cancer in palliative care according to the adapted Nutripal screening based on the log rank test
**Caption:** CRP: C-reactive protein.

analysis is essential to guide appropriate nutritional care. The results demonstrated that lower values of overall survival are associated with higher grades of nutritional risk, both in the complete and adapted versions of the tool.

Alterations such as weight loss, reduced food intake, symptoms, and functional decline are frequent in the oncological context and contribute distinctly to the PG-SGA score. Severe and involuntary weight loss, when assessed in isolation, results in a <9 points score, but is considered a prognostic factor in patients with cancer, with a severe malnutrition classification[23]. In the isolated score analysis, the 9-point cutoff did not demonstrate to be a mortality predictor, in a way that patients classified as being at no nutritional risk evolved to death similarly to those at nutritional risk (7.1% *vs.*

**Table 2**. Cox risk regression of the PG-SGA score, from both complete and adapted Nutripal screening, in predicting survival in cancer patients in palliative care (n=200)

| Variables | | HR (95% CI) | *p* |
|---|---|---|---|
| **<9 points in the PG-SGA scale** | | 1.00 | |
| **≥9 points in the PG-SGA scale** | | 0.99 (0.69–1.41) | 0.97 |
| **Complete Nutripal screening** | Nutritional risk grade | | |
| | Grade 1 | 1.00 | |
| | Grade 2 | 0.87 (0.34–2.23) | 0.78 |
| | Grade 3 | 0.78 (0.53–1.15) | 0.21 |
| | Grade 4 | 1.57 (1.04–2.36) | 0.02 |
| **Adapted Nutripal screening** | Nutritional risk grade | | |
| | Grade 1 | 1.00 | |
| | Grade 2 | 0.79 (0.54–1.15) | 0.22 |
| | Grade 3 | 1.57 (1.04–2.36) | 0.02 |

**Captions:** HR: hazard ratio; CI: confidence interval; PG-SGA: patient-generated subjective global assessment.

8.2%), which can be justified by the aforementioned aspect. A prior study demonstrated that in individuals with incurable cancer, ≥15 scores are associated with shorter survival[23]. Additionally, although the parameters assessed by PG-SGA are relevant components of the malnutrition diagnosis, their prognostic value is not superior to inflammatory markers, which decisively contribute to nutritional decline[24,25]. CRP levels above 10 mg/dL have been associated with a worse prognosis in oncological patients[25].

CRP is an acute-phase protein, an indicator of tissue injury and inflammation[26]. It is an easy-access inflammatory marker of great relevance in the analysis of progression and prognosis of neoplasms[24]. In the present study, the group with <9 points in the PG-SGA presented a mean CRP of 10.6 mg/dL, justifying the high mortality rate, reinforcing the importance of considering multiple parameters in the care practice. Furthermore, an overall survival inferior to 50 days was verified even in patients with CRP and albumin at adequate levels. It is important to highlight that this group was reduced (n=5) and presented an average of 15.6 points in the PG-SGA scale with a severe malnutrition diagnosis.

Severe malnutrition was the most prevalent nutritional diagnosis in the sample. In cancer patients, protein-energy malnutrition may result from both reduced food intake and inflammatory or illness-associated mechanisms, being correlated to clinical and unfavorable outcomes[27]. In PC, these etiologies tend to coexist, aggravating nutritional impairment even more.

The difference between the complete and adapted versions is the use of albumin. It is an accessible marker and can be an indicator of adverse outcomes, with values under 3.5 mg/dL considered hypoalbuminemia[7,28]. However,

in clinical practice, it is not a commonly requested item for systemic inflammation assessment; 218 patients were excluded from the study due to the absence of this biochemical marker, highlighting the importance of the adapted tool.

Similar results were observed regarding the correlation between worse survival and a higher grade of nutritional risk in the tool (complete and adapted), regardless of age, PPS, and oncological diagnosis. The predictive discrimination was moderate, with similar performance between both versions, differing from the result found in the complete tool study (area under curve – AUC 0.76), but which can be associated with the amount of variables used in the study, reduced sample size in the present study, and retrospective design.

Survival analysis of patients with cancer in PC is important for effective and adequate nutritional care, considering the disease prognosis. In patients with a survival estimate higher than six months, nutritional therapy (NT) aims to ensure the proper provision of nutrients, minimize metabolic disorders, and contribute to the preservation of functional performance and quality of life[5-15,23-26]. On the other hand, in the late stage of life, the nutritional approach aims to prioritize patient comfort, not indicating artificial NT due to the absence of proven benefits[5].

PC is highly relevant in the integral care of patients with advanced cancer[29]. The functionality assessment through PPS demonstrated a greater need for a complementary or predominant PC. PPS results ≤30% can predict the last months of life in PC[30]. In the present study, most patients with PPS between 40% and 60% evolved to death, with severe malnutrition being a common finding among them. PPS scores under 60% reflect impaired walking and daily life activities, frequently followed by reduced food intake, which complements the information obtained through PG-SGA. Thus, despite the high mortality observed, the Nutripal tool is indicated to identify nutritional risk, as it is a non-invasive instrument, capable of guiding nutritional care with a focus on quality of life and valuing comfort.

The main strength of this study is being the first to assess the applicability of the Nutripal tool without using albumin, which broadens its potential use in clinical practice. Yet, some limitations must be considered. Because this is a retrospective cohort study with convenience sampling, there is a possibility of selection bias, meaning that the patients included may not adequately represent the population. Furthermore, the sample size and data collection exclusively from electronic records may have caused information bias. We recommend that prospective studies be conducted with larger samples for a more robust assessment of the tool, including a formal validation of the instrument.

## CONCLUSION

The adapted Nutripal screening demonstrated good applicability in identifying nutritional risk, regardless of age, oncological diagnosis, and PPS, predicting poorer survival in patients classified with a higher risk grade. Therefore, the tool is useful for clinical practice and can be incorporated into the care of cancer patients in palliative care when the albumin lab result is unavailable.

### CONTRIBUTIONS

Maria da Paixão Rodrigues has substantially contributed to the study design, planning, data acquisition, analysis, and interpretation, as well as the wording. Aline do Vale Firmino and Thais Manfrinato Miola have substantially contributed to the study design, acquisition, analysis, and interpretation of the data, wording, and critical review with intellectual contribution. All the authors approved the final version for publication.

### DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interest to declare.

### DATA AVAILABILITY STATEMENT

All the contents associated with the article are included in the manuscript.

### FUNDING SOURCES

None.

## REFERENCES

1. Silva IF, Santos RS, Santos ATC, et al. Cuidado nutricional de pacientes com câncer em cuidados paliativos: uma revisão integrativa. Vittalle. 2022;34(1):81-92. doi: https://doi.org/10.14295/vittalle.v34i1.13692
2. Worldwide Hospice Palliative Care Alliance. Com nossos 473 membros organizacionais em mais de 100 países, fornecemos uma voz global sobre cuidados paliativos [Internet]. London: WHPCA; 2023 [acesso 2025 dez 27]. Disponível em: https://thewhpca.org/
3. Hassankhani H, Rahmani A, Taleghani F, et al. Palliative care models for cancer patients: learning for planning in nursing (review). J Cancer Educ. 2020;35(1):3-13. doi: https://doi.org/10.1007/s13187-019-01532-3

4. Laviano A, Di Lazzaro L, Koverech A. Nutrition support and clinical outcome in advanced cancer patients. Proc Nutr Soc. 2018;77(4):388-93. doi: https://doi.org/10.1017/S0029665118000459

5. Horie LM, Barrére APN, Castro MG, et al. Diretriz BRASPEN de terapia nutricional no paciente com câncer. BRASPEN J. 2019;34(1):2-32.

6. Castro M, Ribeiro PC, Matos LBN, et al. Diretriz BRASPEN de terapia nutricional no paciente grave. BRASPEN J. 2023;38(2):2-46. doi: https://doi.org/10.37111/braspenj.diretrizDOENTEGRAV

7. Hart PC, Rajab IM, Alebraheem M, et al. C-reactive protein and cancer-diagnostic and therapeutic insights. Front Immunol. 2020;11:595835. doi: https://doi.org/10.3389/fimmu.2020.595835

8. Rosa KSC, Wiegert EVM, Oliveira LC, et al. Proposal of a nutrition screening algorithm for patients with incurable cancer receiving palliative care. Aspen J. 2023;39(2):485-99. doi: https://doi.org/10.1002/ncp.10953

9. Xie H, Wang S, Wei L, et al. Inflammatory score as a predictor of survival and nutritional deterioration in cancer patients: insights from a multicenter cohort study. Front Nutr. 2025;12:1631483. doi: https://doi.org/10.3389/fnut.2025.1631483

10. Mauriz P, Wirtzbiki PM, Campos UW, et al. Protocolo cuidados paliativos [Internet]. Fortaleza: Instituto de Saúde e Gestão Hospitalar (ISGH); 2014 [acesso 2025 dez 27]. Disponível em: https://isgh.org.br/intranet/images/Servicos/Protocolos/isgh_protoco_cuidado_paliativo.pdf

11. Costa MC, Schieferdecker MEM, Correa MR, et al. Cuidados paliativos: dignidade, fragilidade e funcionalidade na alimentação de conforto. Rev Bioet. 2025;33:e3986. doi: https://doi.org/10.1590/1983-803420253986PT

12. Carvalho CS, Souza DS, Lopes JR, et al. Relationship between patient-generated subjective global assessment and survival in patients in palliative care. Ann Palliat Med. 2017;6(Suppl 1):S4-12. doi: https://doi.org/10.21037/apm.2017.03.03

13. Santos RCC. Aplicação da ASG-PPP no paciente oncológico durante tratamento em clínica particular em Salvador-BA. Braz J Health Rev. 2020;3(4):10756-74. doi: https://doi.org/10.34119/bjhrv3n4-283

14. Forrest LM, McMillan DC, McArdle CS, et al. Evaluation of cumulative prognostic scores based on the systemic inflammatory response in patients with inoperable non-small-cell lung cancer. Br J Cancer. 2003;89(6):1028-30. doi: https://doi.org/10.1038/sj.bjc.6601242

15. Wiegert EVM, Oliveira LC, Chaves GV, et al. New cancer cachexia staging system for use in clinical practice. Nutrition. 2021;90:111271. doi: https://doi.org/10.1016/j.nut.2021.111271

16. Pearson K. On the criterion that a given system of deviations from the probable in the case of a correlated system of variables is such that it can be reasonably supposed to have arisen from random sampling. Philosoph Magazine. 1900;50(302):157-75. doi: https://doi.org/10.1080/14786440009463897

17. Fisher RA. On the interpretation of $\chi^2$ from contingency tables, and the calculation of P. J R Stat Soc A. 1922;85:87-94. doi: https://doi.org/10.2307/2340521

18. Student. The probable error of a mean. Biometrika. 1908;6(1):1-25. doi: https://doi.org/10.2307/2331554

19. Fisher RA. Statistical methods for research workers. Edinburgh: Oliver and Boyd; 1925.

20. Kleinbaum DG, Klein M. Kaplan-Meier survival curves and the log-rank test. In: Kleinbaum DG, Klein M, editors. Survival analysis. Statistics for biology and health. New York: Springer; 2012. p. 19-41. doi: https://doi.org/10.1007/978-1-4419-6646-9_2

21. SPSS®: Statistical Package for Social Science (SPSS) [Internet]. Versão 29. [Nova York]. International Business Machines Corporation. [acesso 2025 mar 9]. Disponível em: https://www.ibm.com/br-pt/spss?utm_content=SRCWW&p1=Search&p4=43700077515785492&p5=p&gclid=CjwKCAjwgZCoBhBnEiwAz35Rwiltb7s14pOSLocnooMOQh9qAL59IHVc9WP4ixhNTVMjenRp3-aEgxoCubsQAvD_BwE&gclsrc=aw.ds

22. Conselho Nacional de Saúde (BR). Resolução nº 466, de 12 de dezembro de 2012. Aprova as diretrizes e normas regulamentadoras de pesquisas envolvendo seres humanos [Internet]. Diário Oficial da União. 2013 jun 13 [acesso 2025 dez 27]; Edição 112;Seção 1:59. Disciplinas: https://bvsms.saude.gov.br/bvs/saudelegis/cns/2013/res0466_12_12_2012.html

23. Schiessel DL, Orrutéa AKG, Silva SE, et al. Perda de peso em pacientes oncológicos: prevalência e prognóstico relacionados a sexo, idade, localização do tumor e sintomas de impacto nutricional. BRASPEN J. 2020;35(1):84-92.

24. Cunha MS, Calixto-Lima L, Wiegert EVM, et al. Validation of the scored Patient-Generated Subjective Global Assessment Short Form as a prognostic tool for patients with incurable cancer. JPEN J Parenter Enteral Nutr. 2021;45(8):1809-17. doi: https://doi.org/10.1002/jpen.2251

25. Yule MS, Machado AM, Brown LR, et al. Dissecting the Global Leadership Initiative on Malnutrition criteria in advanced cancer: reduced intake vs. inflammation.

Clin Nutr ESPEN. 2025;67:114-21. doi: https://doi.org/10.1016/j.clnesp.2025.03.007

26. Pourhassan M, Cederholm T, Donini LM, et al. Severity of inflammation is associated with food intake in hospitalized geriatric patients: a merged data analysis. Nutrients. 2023;15(14):3079. doi: https://doi.org/10.3390/nu15143079

27. Huang Z, Wang K, Huang S, et al. Prognostic value of baseline C-reactive protein in diffuse large B-cell lymphoma: a systematic review and meta-analysis. Transl Cancer Res. 2023;12(8):2169-80. doi: https://doi.org/10.21037/TCR-23-1157

28. Hutajulu SH, Astari YK, Ucche M, et al. Prognostic significance of C-reactive protein (CRP) and albumin-based biomarker in patients with breast cancer receiving chemotherapy. PeerJ. 2025;13:e19319. doi: https://doi.org/10.7717/peerj.19319

29. Kang E, Kang JH, Koh S, et al. Early integrated palliative care in patients with advanced cancer. JAMA Netw Open. 2024;7(8):e2426304. doi: https://doi.org/10.1001/jamanetworkopen.2024.26304

30. Prompantakorn P, Angkurawaranon C, Pinyoporpanish K, et al. Palliative Performance Scale and survival in patients with cancer and non-cancer diagnoses needing a palliative care consultation: a retrospective cohort study. BMC Palliat Care. 2021;20(1):73. doi: https://doi.org/10.1186/s12904-021-00773-8

**Recebido em 7/1/2026**
**Aprovado em 9/3/2026**

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Scientific-editor: Anke Bergmann. Orcid iD: https://orcid.org/0000-0002-1972-8777