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Association between Patient Generated Subjective Global Assessment and NUTRISCORE in ambulatory oncology patients

Associação entre a Avaliação Subjetiva Global Produzida pelo Paciente e a NUTRISCORE em pacientes oncológicos ambulatoriais

Abstract

Objective: Determine the association between two nutritional screening tools (NUTRISCORE and PG-SGA) for use on oncological outpatients. *Methods:* A cross-sectional study was conducted with male and female cancer patients (adults and elderly) at the Oncology Clinic of Barão de Lucena Hospital in Recife, Brazil. Data were collected on demographic, socioeconomic, lifestyle, clinical and anthropometric characteristics. Nutritional screening was performed using the patient-generated subjective global assessment (PG-SGA) and NUTRISCORE. The data were analyzed with the aid of the Statistical Package for the Social Sciences (SPSS, version 13.0), with a 5% significance level ($p<0.05$). ***Results:*** The sample was composed of 65 patients (mean age: 58.53 ± 12.66 years). Adults and females accounted for 53.8% and 78.5% of the sample, respectively. The most common condition was breast cancer (52.3%), followed by gastrointestinal cancer (23.1%). Using NUTRISCORE and PG-SGA, the nutritional risk was detected in 41.5% and 40% of the patients, respectively.

A significant association was found between PG-SGA and NUTRISCORE (p=0.001). Considering the anthropometric variables, patients with higher mean tricipital skinfold values were considered to be not at risk based on NUTRISCORE (p=0.026). ***Final considerations:*** NUTRISCORE proved to be an adequate means for the detection of nutritional status in oncological outpatients, as it was significantly associated with the gold standard (PG-SGA) and proved to be easier to apply in clinical practice.

Keywords: Cancer. Screening. Nutritional Status. Malnutrition.

Resumo

Objetivo: Verificar a associação entre as triagens de risco nutricional NUTRISCORE e ASG-PPP em pacientes oncológicos ambulatoriais. ***Métodos:*** Estudo de delineamento transversal conduzido com pacientes portadores de câncer, adultos e idosos, de ambos os sexos, atendidos no Ambulatório de Oncologia do Hospital Barão de Lucena, Recife-PE. Foram obtidos dados referentes às variáveis demográficas, socioeconômicas, de estilo de vida, clínicas, antropométricas, e as triagens nutricionais ASG-PPP e NUTRISCORE. Os dados foram analisados no programa ***Statistical Package for the Social Sciences*** (SPSS) versão 13.0, e adotou-se significância estatística o valor de p<0,05. ***Resultados:*** A amostra incluiu 65 pacientes com idade média entre 58,53 ± 12,66 anos, dos quais 53,8% eram adultos e 78,5% do sexo feminino. A neoplasia mais observada foi a de mama (52,3%), seguida das gastrointestinais (23,1%). Tratando-se das triagens nutricionais aplicadas, a NUTRISCORE identificou 41,5% dos pacientes com risco nutricional; já a ASG-PPP detectou 40%. Houve associação estatisticamente significante da ASG-PPP com a NUTRISCORE (p=0,001). Considerando-se a média das variáveis antropométricas com o instrumento de triagem NUTRISCORE, o estudo revelou que pacientes com médias elevadas da prega cutânea tricipital evidenciaram ausência de risco nutricional pela NUTRISCORE (p=0,026). ***Considerações finais:*** A NUTRISCORE demonstrou ser um método interessante na detecção do estado nutricional de pacientes oncológicos em ambulatório, uma vez que se associou com a ASG-PPP (padrão ouro), além de ser de mais fácil aplicação na prática clínica.

Palavras-chave: Câncer. Triagem. Estado Nutricional. Desnutrição.

INTRODUCTION

Malnutrition and nutritional risk are prevalent problems in cancer patients, due to the impact of the disease and the side effects of treatments, which tend to worsen during the admission period and are associated with increased morbidity and mortality, length of hospital stay and health costs.[1,2]

Validated instruments for verifying nutritional risk are called nutritional screening, and this is considered the first tool in the process of identifying patients with malnutrition or who may evolve to this condition and who need nutritional assessment and early intervention.[3] Among the available tools, the Patient Generated Subjective Global Assessment (PG-SGA) is the screening considered the gold standard for oncologic patients.[4]

There is also a new screening tool specifically designed to detect the nutritional risk of cancer patients in outpatient care, NUTRISCORE. This is considered a simple instrument, easy to apply, with high sensitivity and specificity, and can be applied by any health professional in less time in relation to other methods described in the literature.[5] NUTRISCORE was developed by a Spanish group and published in an English-language journal, being recently validated in a patient population of the Catalan Institute of Oncology (ICO) in Spain; however, it has not yet been validated in Brazil. This screening presents a distinction in relation to the PG-SGA, because although it is considered a specific method to assess nutritional risk in cancer patients, it has not yet been validated in an outpatient oncology setting.[6]

Considering that carcinogenesis is a condition that leads to several metabolic alterations, such as hypercatabolism and activation of pro-inflammatory mediators that contribute to the genesis of malnutrition, cachexia and worsening of the prognosis of individuals, the application of different nutritional screening tools in cancer patients, specifically those that consider the oscillations in nutritional status, the type of tumor and the treatment used, may contribute to early nutritional diagnosis and dietary interventions that provide maintenance/recovery of nutritional reserves and improvement in quality of life.

Due to the lack of outpatient studies especially involving the use of NUTRISCORE and PG-SGA (gold standard for cancer patients), the present investigation aimed at verifying the association between NUTRISCORE and PG-SGA nutritional risk screening in oncology outpatients.

METHODOLOGY

Cross-sectional design study conducted at the oncology unit of Hospital Barão de Lucena (HBL) located in the city of Recife-PE, from May to November 2016. The research was developed after approval by the Ethics Committee on Research in Human Beings of the Agamenon Magalhães Hospital, under Certificate of Presentation for Ethical Assessment (CAAE) 55378316.8.0000.5197. During the interview, the researcher explained the objective of the study, as well as the risks and benefits.

Outpatients with a diagnosis of cancer, over 18 years of age, of both sexes, seen at the Oncology Outpatient Clinic during the study period and who corroborated their participation by signing the Free and Informed Consent Form (TCLE) were evaluated. Pregnant women, amputees, patients with a 10% KarnofsKy performance scale (classified by the method as a dying individual, imminent death) and those with special needs, such as mental disorders (considering any type of disorder that would affect the cognitive capacity), were excluded from the sample. Although mental disorders were an exclusion criterion, no patients were excluded for this reason.

The evaluated data were sociodemographic, lifestyle, comorbidities, cancer (type), antineoplastic therapy, nutritional screening and anthropometric evaluation. These variables were included in a structured questionnaire developed specifically for the study. The analysis of the demographic and socioeconomic variables of the participants was carried out using the criteria established by IBGE;[7] in addition, the individuals were also classified by socioeconomic class, according to the recommendations of the Brazilian Association of Research Companies (ABEP),[8] which divides the classes into categories from A to E.

The lifestyle assessment included data on smoking, alcohol consumption and physical activity. The level of physical activity was assessed through an adaptation of the IPAQ Scoring Protocol short version, and it was possible to classify patients into two categories. Category 1 included inactive patients or those who practiced physical activity, but not enough to reach category 2. In category 2, we included those who performed minimum physical activity for five or more days of moderate intensity or walking for at least 30 minutes per day.[9]

Regarding smoking, the following variables were used: smokers, former smokers and non-smokers.[10] Regarding alcoholism, patients who consumed up to two doses of alcohol per day for males and up to one dose for females were classified as low risk. For consumption higher than this amount, it was considered as high-risk intake.[11]

The nutritional diagnosis was obtained through two screening instruments: NUTRISCORE, a tool designed to detect nutritional risk in oncologic outpatients that evaluates

weight loss, changes in food intake, tumor site and treatment used;[5] and PG-SGA, which is recommended for application in patients with cancer, composed of two stages - the first is completed by the patient, and the second, by the nutritionist (researcher). The cut-off points adopted for nutritional risk classification were ≥5[5] for NUTRISCORE and >9[12] for PG-SGA.

Regarding anthropometric variables, weight, height, body mass index (BMI), brachial circumference (CB), triceps skin fold (PCT), arm muscle circumference (CMB) and corrected arm muscle area (AMBc) were analyzed.

The weight was measured on an electronic scale (Balmak®), with a capacity of 150 kg and sensitivity of 100 grams, with patients without shoes and with light clothing positioned in the center of the scale, according to the Frankfurt plan.[13] The height was verified using a stadiometer coupled to the scale with scale in centimeters and millimeters.

To determine the BMI, the equation "weight/height^2" was used. Adult patients were classified according to the cut-off points recommended by the World Health Organization (WHO),[14] and the elderly (age > 60 years), according to the Pan American Health Organization.[15]

The brachial circumference (CB) was measured with an inelastic tape measure on the non-dominant arm at the midpoint between the acromion and the olecranon. Patients were instructed to keep the arm flexed along the body and the palm of the hand facing the thigh. The measurement was performed with the tape adjusted to avoid compression or loosening of the skin.[13] Then, the triceps skin fold (PCT) was clamped with the aid of a CESCORF® scientific adipometer, at the same midpoint used to measure the circumference of the arm. The measurement was performed in triplicate, and the mean of the values obtained was used for analysis.[16]

The arm muscle circumference (CMB) was obtained through the values of CB and PCT, using the formula established by Jelliffe:[17] CMB = CB - 3.14 x PCT. To obtain the corrected arm muscle area (AMBc), formulas that vary according to gender were used. The classifications of CB, PCT, CMB, AMBc were determined by means of predictive equations and tables proposed by Nhanes[18] and Frisancho.[19]

The data were analyzed in the Statistical Package for the Social Sciences (SPSS) program, version 13.0 for Windows. Continuous variables were tested for normality using the Kolmogorov Smirnov test and presented as mean and standard deviation. Categorical data were presented as frequencies accompanied by their respective 95% confidence intervals (95% CI). To verify the association between categorical variables, Pearson's Chi-square test was used, and the continuous data were compared using the Student's t-test. To reject the null hypothesis, the p-value <0.05 was adopted.

RESULTS

The sample consisted of 65 patients with a mean age of 58.53 ± 12.66 years, of whom 53.8% were adults and 46.2% were elderly. The most frequent neoplasm was breast cancer (52.3% n= 34), followed by gastrointestinal neoplasms (mouth, esophagus, stomach and intestine tumors) (23.1% n= 15). Table 1 shows the sociodemographic characteristics of the group. Most of the sample (78.5%) was female, from lower social classes (D and E), non-smokers (60%), low-risk consumers of alcoholic beverages (96.9%) and physically inactive or practicing light activities (87.7%).

Table 1. Sociodemographic characteristics of oncologic patients seen in outpatient clinics at Hospital Barão de Lucena. Recife, PE, 2018.

Variables	N=65	%	$IC_{95\%}$
SEX			
Male	14	21,5	12,3 – 33,5
Female	51	78,5	66,5 – 87,7
AGE GROUP			
Adult	35	53,8	41,0 – 66,3
Elderly	30	46,2	33,7 – 58,9
SCHOOLING			
Illiterate	18	27,7	17,3 – 40,1
Fundamental Education 1 complete, 2 incomplete	29	44,6	32,2 – 57,4
Fundamental Education 2 complete, High School incomplete	4	6,2	1,7 – 15,0
High School complete/ Higher Education incomplete	11	16,9	8,7 – 28,2
Higher Education complete	3	4,6	0,96 – 12,9
ECONOMIC CLASS			
B/C	28	43,1	30,8 – 55,9
D/E	37	56,9	44,0 – 69,1

Table 1. Sociodemographic characteristics of oncologic patients seen in outpatient clinics at Hospital Barão de Lucena. Recife, PE, 2018. (cont.)

Variables	N=65	%	$IC_{95\%}$
SMOKING			
Smoker	2	3,1	0,37 – 10,6
Non- smoker	39	60,0	47,0 – 71,9
Former smoker	24	36,9	25,2 – 49,8
ALCOHOLISM			
High-risk consumption	2	3,1	0,3 – 10,6
Low-risk consumption	63	96,9	89,3 – 99,6
PHYSICAL ACTIVITY			
Category 1	57	87,7	77,1 – 94,5
Category 2	8	12,3	5,4 – 22,8

Source: AGUIAR, G.B; 2018.

IC95%: 95% confidence interval.

Category 1: inactive/light activity; Category 2: walking for at least 30 minutes a day or activity for 5 or more days of moderate intensity (International Physical Activity Questionnaire, IPAQ, 2005).

Regarding the clinical characteristics, there was a predominance of asymptomatic patients (66.2%), patients using medication (58.5%), without comorbidities (47.7%), submitted to surgery for tumor resection (75.4%) and undergoing chemotherapy (84.6%), as shown in table 2.

Table 2. Sociodemographic characteristics of oncologic patients treated at the outpatient clinic of Hospital Barão de Lucena. Recife-PE, 2018.

Variables	N=65	%	$IC_{95\%}$
CANCER SITE			
Breast	34	52,3	39,5 – 64,8
Gastrointestinal	15	23,1	13,5 – 35,1
Reproductive system	13	20,0	11,1 – 31,7
Other	3	4,6	0,9 – 12,9
SYMPTOMS			
Yes	22	33,8	22,5 – 46,6
No	43	66,2	53,3 – 77,4
MEDICINES			
Yes	38	58,5	45,5 – 70,5
No	27	41,5	29,4 – 54,4
SURGERY			
Yes	49	75,4	63,1 – 85,2
No	16	24,6	14,7 – 36,8
CHEMOTHERAPY			
Yes	55	84,6	73,5 – 92,3
No	10	15,4	7,6 – 26,5
RADIOTHERAPY			
Yes	34	52,3	39,5 – 64,8
No	31	47,7	35,1 – 60,4
COMMORBITIES			
Diabetes	6	9,2	3,4 – 19,0
Hypertension	25	38,5	26,6 – 51,3
Diabetes/Hypertension	3	4,6	0,9 – 12,9
Nocomorbidities	31	47,7	35,1 – 60,4

Source: AGUIAR, G.B; 2018.

IC95%: 95% confidence interval.

Regarding the screening tools applied, NUTRISCORE identified that 41.5% of the patients were at nutritional risk; PG-SGA showed that 40% were at risk. There was a statistically significant association between PG-SGA and NUTRISCORE (p=0.001).

Regarding the anthropometric parameters (table 3), a high percentage of malnutrition was evidenced by CMB (83.1%), eutrophication by variables AMBc (67.7%) and CB (50.8%), and overweight, according to BMI (55.4%) and PCT (61.5%).

Table 3. Frequency of the different nutritional diagnoses of oncologic patients seen in outpatient clinics of Hospital Barão de Lucena. Recife- PE, 2018.

Variables	N=65	%	$IC_{95\%}$
BMI			
Low weight	6	9,2	3,4 – 19,0
Eutrophy	23	35,4	23,9 – 48,2
Excess weight	36	55,4	42,5 – 67,7
CB			
Malnutrition	17	26,2	16,0 – 38,5
Eutrophy	33	50,8	38,0 – 63,3
Excess weight	15	23,1	13,5 – 35,2
CMB			
Malnutrition	54	83,1	71,7 – 91,2
Eutrophy	11	16,9	8,7 – 28,2
PCT			
Malnutrition	15	23,1	13,5 – 35,2
Eutrophy	10	15,4	7,6 – 26,5
Excess weight	40	61,5	48,6 – 73,3

Table 3. Frequency of the different nutritional diagnoses of oncologic patients seen in outpatient clinics of Hospital Barão de Lucena. Recife- PE, 2018. (cont.)

Variables	N=65	%	$IC_{95\%}$
AMBc			
Malnutrition	21	32,3	21,2 – 45,0
Eutrophy	44	67,7	54,9 – 78,7

Source: AGUIAR, G.B; 2018.

IC95%: 95% confidence interval.

BMI: body mass index; CB: brachial circumference; CMB: muscle circumference of the arm; PCT: triceps skin fold; AMBc: corrected arm muscle area.

Considering the mean of the anthropometric variables (table 4) with the NUTRISCORE screening instrument, the study revealed that patients with high PCT means showed no nutritional risk according to NUTRISCORE (p=0.026).

Table 4. Comparison of the means of anthropometric parameters in oncologic patients with and without nutritional risk seen in the outpatient clinic at Hospital Barão de Lucena. Recife-PE, 2018.

Variables	At Risk (n=27)	No Risk (n=38)	p-value*
BMI (Kg/m2)	27,1±4,9	29,1±6,4	0,185
CB (cm)	29,6±3,6	30,8±6,0	0,305
CMB (cm)	21,6±3,4	21,2±4,08	0,702
PCT (mm)	25,1±10,3	31,3±11,2	0,026*
AMBc $(cm)^2$	30,5±11,8	31,7±15,2	0,728

Source: AGUIAR, G.B; 2018.

* p<0.05 (Student's T test).

BMI: body mass index; CB: brachial circumference; CMB: muscle circumference of the arm; PCT: triceps skin fold; AMBc: corrected arm muscle area.

DISCUSSION

Studies using the association between PG-SGA and NUTRISCORE are scarce in the literature. This is, so far, the first research developed in Brazil that makes use of the new screening instrument NUTRISCORE to identify nutritional risk in oncologic patients seen in outpatient clinics.

In the present study, 78.5% of the individuals evaluated were female and, of these, 52.3% were diagnosed with breast cancer. These findings are in line with projections from the National Cancer Institute (INCA),[20] which, except for non-melanoma skin neoplasms, point to breast cancer as the second most incident type of cancer in Brazil, and the first most prevalent in the Northeast Region. Similar results to the current research were found in the investigation by Gabrielson et al.,[6] conducted in Canada, which evaluated 90 ambulatory cancer patients in chemotherapy, corroborating a percentage of 69% female and 45.5% with neoplasm site in breast tissue. The studies by Brito et al.,[21] and Nicolussi et al.,[22] carried out with patients from the same population of the study also revealed breast cancer as the most observed type of cancer among the individuals analyzed.

Gastrointestinal tract tumors were the second most frequently diagnosed type of cancer, reaching a percentage of 23.1% of the total sample, similar to the study by Abbott et al.,[23] who, when studying 300 outpatients with cancer in Australia, detected 21% with this type of neoplasm, which was the second most frequent type, as in the current study.

Regarding the sociodemographic characteristics, there was great participation of individuals from social classes D and E. This can be explained by the fact that the Hospital where the study was conducted is predominantly in the public domain and provides care to individuals registered in the Unified Public Health System (SUS).

Furthermore, it was observed that 60% of the individuals were non-smokers and 96.9% were low-risk consumers of alcoholic beverages. Such an event may have occurred due to the fact that most of the sample was composed of women and because the pathological condition and the treatment limited these habits to a certain extent. Regarding the practice of physical activity, a significant percentage of 87.7% of physically inactive patients or those who practiced light activities is observed, which is in line with the study by Cunha et al.,[24] who detected 82% of inactive individuals when evaluating 150 patients with cancer under chemotherapy treatment.

It is important to emphasize that physical inactivity is a factor that contributes to weight gain, development and persistence of fatigue in cancer patients, and can lead to physical deconditioning, a condition that can impair the daily activities of these individuals.[25,26]

Regarding the clinical characteristics of the present investigation, 75.4% of the patients had undergone surgery for tumor resection; this data is similar to the study by Nicollussi et al.,[22] who indicated 77.0% when investigating 152 oncologic patients in Ribeirão Preto-SP. Regarding antineoplastic therapy, 84.6% of the evaluated group used chiropractic treatment. Gomes & Maio,[27] in a study with cancer patients, found values close to this finding, 83%.

In the present sample, although the majority of patients underwent chemotherapy treatment, 66.2% reported no symptoms of the gastrointestinal tract at the time of the evaluation, a result that diverged from that revealed by Miranda et al.,[28] who identified 88.3% of individuals with at least one symptom resulting from chemotherapy treatment, when evaluating 60 patients in the city of Belém, PA. In the study by Sánchez-Lara et al.,[29] gastrointestinal symptoms such as anorexia, nausea and vomiting were significantly correlated with weight loss in individuals who received chemotherapy.

Nutritional screening instruments are the first tools that should be used to identify patients at nutritional risk so that a more detailed assessment and early nutritional intervention can be performed on those with compromised nutritional status.[5]

Thus, regarding the frequency of nutritional risk by the screening tools applied, NUTRISCORE, as a new screening instrument designed for ambulatory cancer patients, categorized 41.5% of individuals with nutritional risk, and PG-SGA identified 40%. There was a statistically significant association (p=0.001) between these two screening protocols. However, as there are no studies in the literature to date involving the application of NUTRISCORE, the scientific evidence shown here will be limited to PG-SGA.

Abbot et al.,[23] in a cross-sectional study with 300 outpatients in Australia using PG-SGA to assess nutritional status, documented a lower percentage of patients with nutritional risk, 17%, compared to that found in the sample studied. In the study by Sharma et al.,[30] conducted in India, PG-SGA detected a higher frequency of malnutrition in patients with oral cavity neoplasms when compared to malignant neoplasms in other sites. This finding is in line with the Brazilian Oncological Nutrition Survey (IBNO),[31] carried out with cancer patients hospitalized in 45 institutions in 16 states of Brazil and the Federal District (including the hospital where this study was conducted). Through PG-SGA, this study showed a prevalence of malnutrition or nutritional risk that ranged from 62% to 85.0% of patients with the presence of tumors in the oral cavity, esophagus and stomach, and this diagnosis was detected in individuals with greater impact on eating habits.

Therefore, the percentage of patients with nutritional risk evidenced in this study can be justified, since most of the sample had a diagnosis of breast cancer, and it is known that this type of neoplasm is considered to have low nutritional risk in relation to malignant tumors in

other locations.[31,32] Furthermore, it is suggested that patients with cancer seen in outpatient clinics present lower nutritional risk,[33] in comparison with patients in hospitals.[34] In addition, it should be noted that the screenings applied included items on food intake changes, presence of gastrointestinal symptoms and weight changes, but as there was a low frequency of symptomatic and malnourished individuals, the final score may have been influenced by these questions, leading to an important diagnosis of patients with nutritional risk.

Cancer and the treatments used to treat this pathology are associated with muscle and weight changes, such as loss of muscle mass, increase in fat mass and weight gain. Increased fat tissue and obesity are risk factors for cardiometabolic diseases, while muscle mass depletion is related to the development of syndromes such as cachexia.[35]

Regarding the nutritional status according to the BMI variable, it can be seen that 55.4% of the patients in this sample were overweight. Cagol et al.,[36] studying 189 oncologic patients seen in an outpatient clinic with characteristics similar to those of the current research (most with malignant tumor in the breast), detected 48.6% using the same parameter.

In the study by Miranda et al.,[28] excess weight was more frequent in patients with breast neoplasms, and weight gain in the last six months also prevailed in these patients. The plausible explanations for the prevalence of overweight in patients with breast neoplasms are due to the drugs used in chemotherapy, which can induce increased appetite and cause fluid retention, and mask malnutrition in these individuals; and the use of hormonal therapy and drugs to prevent the side effects of chemotherapy such as glucocorticoids, which are associated with weight gain. In addition, the high percentage of physically inactive patients in this study may also have contributed to weight gain.[37-40] It is important to note that the BMI, when used alone, is not a reliable parameter to assess the nutritional status of this population, since it does not differentiate muscle tissue from fat mass, which makes it necessary to use in association with other variables to avoid bias in the nutritional diagnosis.[30]

As for body composition, although 55.4% of individuals were diagnosed with overweight by BMI, 83.1% showed malnutrition by CMB, a percentage lower than that found by Brito et al.,[21] who detected a frequency of 67.3% individuals malnourished using the CMB variable. In this context, this condition suggests that BMI, when used alone, may lead to omission of malnutrition in these patients due to fluid retention associated with the therapy and use of medications.[38] It is also inferred that the patients evaluated in this research may have different degrees of sarcopenic obesity, characterized by loss of lean mass and gain of fat tissue.

On the other hand, excess weight is observed using PCT in 61.5% of the group and eutrophy is observed using AMBc in 67.7%, a result that diverges from that demonstrated by Brito and colleagues, who identified high percentages of severe malnutrition by analyzing the

same parameters in a cross-sectional study with 101 cancer patients.[21] However, it is worth considering the difference between the populations evaluated in terms of sample size, prevailing gender, cancer types (sample with greater variety of neoplastic sites) and presence of symptoms that might have influenced the difference in results.

When comparing the mean of the anthropometric parameters with NUTRISCORE, a significant absence of nutritional risk was revealed in patients with high PCT. This finding suggests that the fat reserve measured by PCT may act as protection for nutritional risk in these individuals. These evidences partially corroborate the study by Araújo et al.,[32] conducted with patients with breast cancer, which verified that 50% of the sample had excess weight using the PCT mean.

It is important to point out that this research presented some limitations that should be considered for the interpretation of the results, such as the type of study that limits the association of cause and effect, and the scarcity of studies involving NUTRISCORE, a tool that was validated in the Spanish population, which made it impossible to discuss the results in depth.

Although the sample studied shows to be small, it was possible to evaluate the screening instrument recently validated for the outpatient oncologic population and to associate PG-SGA, aiming at better determination of the nutritional status of the patients evaluated. In view of the above, it can be concluded that NUTRISCORE proved to be an interesting method to detect the nutritional status of ambulatory oncologic patients, since it was associated with PG-SGA (gold standard), besides being easier to apply in the clinical practice.

FINAL CONSIDERATIONS

The findings of the present study suggest that there was an important frequency of patients with nutritional risk according to the NUTRISCORE and PG-SGA screening, with a statistically significant association between these instruments. In addition, patients who presented a high PCT mean showed no nutritional risk according to NUTRISCORE.

Further studies should be conducted using this new screening protocol in outpatient oncology patients, since it is a simple method, easy to apply and does not require extensive training when compared to PG-SGA.

However, the importance of clinical care to overweight/obese patients is emphasized, since this condition may influence the treatment against cancer, besides being associated with the development of cardiometabolic diseases and worsening of the prognosis of this population.

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Collaborators

GB Aguiar worked on all stages of the study, from conception to final review of the article; KF Dourado participated in the study design and final version; MIS Andrade worked on the study design, analysis and interpretation of data; MI Peixoto performed all stages of the study, from conception to final review of the article; CB Aguiar and CM Santos participated in the final writing of the article.

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