Factors Associated with Health-Related Quality of Life of Cancer Patients Undergoing Clinical Treatment

Fatores Associados à Qualidade de Vida Relacionada à Saúde de Pacientes com Câncer em Tratamento Clínico
Factores Asociados con la Calidad de Vida Relacionada con la Salud de los Pacientes con cáncer en Tratamiento Clínico

Aline Saltaréllo de Jesus[1]; Simara Rodrigues Ajala[2]; Camila Armstrong Saldanha[3]; Maria Cláudia Bernardes Spexoto[4]

Abstract

Introduction: Protected nutritional status, health-related quality of life (HRQOL) and appetite provide longer survival for cancer patients. Oscillations are common during treatment, but little is known about factors interfering with HRQOL. **Objective:** To assess the factors associated with the HRQOL of patients with cancer. **Method:** A cross-sectional study with 110 cancer patients undergoing clinical treatment. Sociodemographic, clinical, HRQOL, nutritional status and appetite variables were collected. The instruments used were the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 30, the Subjective Global Assessment (SGA) and the Cancer Appetite and Symptom Questionnaire. For statistical analysis, the level of significance was 5%. **Results:** The majority were female (62.72%) with a mean age of 74.41±24.54 years, married (70.0%), without working activity (51.82%) and belonging to economic class B (54.54%). The most prevalent type of cancer in this population was breast cancer (30.0%), with staging IV (34.44%) and absence of metastasis (53.64%). The appetite impairment was identified as a factor associated with HRQOL, presenting significant difference in the global health and QoL (quality of life). Emotional function was the most damaged. Fatigue was the symptom that presented the highest score. **Conclusion:** Appetite impairment was associated with the global health and QoL of cancer patients in oncologic treatment.
Key words: Neoplasms; Quality of Life; Appetite; Nutritional Status.

Resumo

Introdução: Estado nutricional, qualidade de vida relacionada à saúde (QVRS) e apetite preservados proporcionam maior sobrevida aos pacientes oncológicos. Suas oscilações são comuns durante o tratamento, mas pouco se conhece sobre os fatores interferentes na QVRS. **Objetivo:** Avaliar os fatores associados à QVRS de pacientes com câncer. **Método**: Estudo transversal com 110 pacientes com câncer em tratamento clínico. Foram coletadas as variáveis sociodemográficas, clínicas, QVRS, estado nutricional e apetite. Os instrumentos utilizados foram o *European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 30*, a Avaliação Subjetiva Global (ASG) e o *Cancer Appetite and Symptom Questionnaire*. Para análise estatística, considerou-se o nível de significância de 5%. **Resultados:** A maioria era do sexo feminino (62,72%) com média de idade igual a 74,41±24,54 anos, casada (70,0%), sem atividade de trabalho (51,82%) e pertencente à classe econômica B (54,54%). O tipo de câncer mais prevalente nessa população foi o câncer de mama (30,0%), com estadiamento IV (34,44%) e ausência de metástases (53, 64%). O comprometimento do apetite foi identificado como fator associado à QVRS, apresentando diferença significativa na saúde global e na QV (p<0,001). A função emocional foi a mais prejudicada. A fadiga foi o sintoma que apresentou maior pontuação. **Conclusão:** O comprometimento do apetite apresentou associação com a saúde global e a QV dos pacientes em tratamento oncológico.
Palavras-chave: Neoplasias; Qualidade de Vida; Apetite; Estado Nutricional.

Resumen

Introducción: Estado nutricional, calidad de vida relacionada con la salud (CVRS) y apetito conservado proporcionan una supervivencia más larga para los pacientes con cáncer. Sus oscilaciones son comunes durante el tratamiento, pero se sabe poco sobre los factores de interferencia en la CVRS. **Objetivo:** Evaluar los factores asociados con la CVRS de los pacientes con cáncer. **Método:** estudio transversal con 110 pacientes con cáncer en tratamiento clínico. Incluimos variables sociodemográficas, clínicas, de CVRS, estado nutricional y apetito. Los instrumentos utilizados fueron el Cuestionario básico 30 de la Organización Europea para la Investigación y el Tratamiento del Cáncer, la Evaluación global subjetiva (EGS) y el cuestionario sobre el apetito y los síntomas del cáncer. Se consideró nivel de significancia del 5%. **Resultados:** La mayoría era mujeres (62,72%) con una edad media de 74,41±24,54 años, casada (70,0%), sin actividad laboral (51,82%) y perteneciente a clase económica B (54,54%). El tipo de cáncer más frecuente era el cáncer de mama (30,0%), estadificación IV (34,44%) y sin metástasis (53,64%). El deterioro del apetito fue identificado como factor asociado con la CVRS, mostrando diferencia significativa en lo generale de salud y CV. La función emocional fue la más deteriorada. Fatiga fue el síntoma con el puntaje más alto. **Conclusión:** El deterioro del apetito se asoció con la salud general y CV de los pacientes en tratamiento contra el cáncer.
Palabras clave: Neoplasias; Calidad de Vida; Apetito; Estado Nutricional.

[1] Universidade Federal da Grande Dourados (UFGD). Dourados (MS), Brazil. Orcid iD: https://orcid.org/0000-0002-7196-470X
[2] UFGD. Dourados (MS), Brazil. Orcid iD: https://orcid.org/0000-0001-6164-1272
[3] Oncoclínica Dourados. Dourados (MS), Brazil. Orcid iD: https://orcid.org/0000-0002-4671-2228
[4] UFGD. Dourados (MS), Brazil. Orcid iD: https://orcid.org/0000-0001-7681-1422
Address for correspondence: Maria Cláudia Bernardes Spexoto. UFGD/Faculdade de Ciências da Saúde/Curso de Nutrição. Rodovia Dourados, Itahum, Km 12 - Unidade II - Cidade Universitária - Caixa Postal: 364. CEP 79.804-970. Dourados (MS), Brazil. E-mail: mariaspexoto@ufgd.edu.br

INTRODUCTION

Cancer is the second main cause of death in the world and was responsible for 9.6 million deaths in 2018. Globally, one in every six deaths is related to this disease. According to the World Health Organization – WHO, approximately 70% of the deaths by cancer occur in low and medium income countries[1], being one of the main problems of public health in Brazil. According to "Instituto Nacional de Câncer José Alencar Gomes da Silva (INCA)"[2], the estimate for each year of 2018-2019 in Brazil is more than 600 thousand new cases of cancer, neoplasms of prostate (68 thousand) is more frequent in males and breast (60 thousand) in females.

With the progress of the treatments, patients' survival with cancer has increased along the years. Therefore, investigators are deeply interested in studying health-related quality of life (HRQOL) and the impacts of the treatment [3].

HRQOL refers to the subjective perceptions of the positive and negative aspects of the symptoms of patients with cancer, including physical, emotional, social and cognitive functions and, mainly, symptoms of diseases and side effects of the treatment [4].

Innumerous are the negative repercussions and various are the symptoms of the nutritional impact resulting from the treatment and/or the disease itself[5]. Among these, appetite disorders, primary anorexia (within the central nervous system) being the most common cause of lack of appetite and reduction of food intake, especially for those submitted to chemotherapy [6]. Lack of appetite can be attributed to changes of flavor and odor of food, palate, early satiety as well as nausea and vomits, among others [7].

In clinical practice, it is of utmost relevance the utilization of instruments that investigate the early appearance of these symptoms because they can cause the worsening of the course of the disease, lower adherence to the treatment and increase of morbimortality, which justifies the importance of studying the nutritional status as well, the HRQOL and the appetite, because it is known that patients with preserved nutritional status, good HRQOL and low commitment of appetite have bigger survival and body weight usually healthier.

In the literature, the side effects of the treatment, of HRQOL and nutritional status of patients with cancer are known, but little is investigated about HRQOL related aspects, specially about changes of appetite, using specific instruments and validated for the analysis of the nutritional status, HRQOL and impairment of the appetite. This study was conducted with the objective of evaluating the HRQOL associated aspects of patients with cancer.

METHOD

It was conducted a cross-sectional study with non-probabilistic sampling design by convenience. It were enrolled 110 patients at a private clinic in Mato Grosso do Sul rural area, in Brazil's West-Central Region. The data were collected between November 2017 and May 2019.

It were included adult patients, both genders, with diagnosis of malignant neoplasm in clinical treatment who agreed and signed the Informed Consent Form (ICF).

The exclusion criteria were patients submitted to large scale surgical procedures, with characteristics that hampered the completion of anthropometry and study questionnaires, with cognitive deficit or severe psychiatric disorders, individuals under 20 years old, pregnant women, postpartum women, infants and Indian population.

For the sample characterization, it were considered clinic and sociodemographic variables. The sociodemographic included age groups (adult/elders), gender, age, marital status, labor and economic class. The age was analyzed in completed years, labor was analyzed dichotomously (works/does not work). Economic class was determined according to the "*Critério de Classificação Econômica Brasil da Associação Brasileira de Empresas de Pesquisa*[8]" (Brazil Criteria of Economic Classification of the Brazilian Association of Research Companies".

Among the clinical variables, it were collected: type of treatment, diagnostic groups, clinical staging of the disease and metastasis (presence/absence).

Initially, to establish the diagnostic groups, it were collected the primary diagnosis of the patients and, next, they were grouped according to the systems of the human body.

It is worth mentioning that the sociodemographic variables were obtained with a face-to-face interview and the clinical variables, through review of the patient's electronic chart.

To evaluate the HRQOL, it was utilized the instrument *European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 30* (EORTC/QLQ-C30), third version in Portuguese proposed by the *European Organization for Research and Treatment of Cancer*[4]. This instrument consists of 30 items with response scale type *Likert* distributed in four scores (no=1, poor=2, moderate=3 and muito=4), with the exception of the global health scale and QL (items 29 and 30) ranging from 1 to 7 (1=very poor and 7=excellent). The items are subdivided in five functioning scales: 1) physical function (FF), 2) cognitive function (CF), 3) emotional function (EF), 4) social function (SF) and 5) role performance (RP); three functioning scales: fatigue, pain, nausea and vomit;

five isolated items that also evaluate symptoms: dyspnea, appetite, insomnia, constipation and diarrhea; one item that evaluated financial difficulty (FD) of the treatment of the disease and a general global health scale and QL.

The instrument has scores from 0 to 100, the highest represents a scale of highest response. About its interpretation, the highest score for the functioning scales represents a very high/healthy level of functioning. However, in the scales of symptoms and isolated items, the higher the score, more impairment/presence of symptoms (high level of symptomatology/problems). For global health scale and QL, the same interpretation of the functioning scales applies, the highest score, better is the general health and HRQOL of the patient [4].

For the assessment of the appetite impairment and presence of symptoms of nutritional impact, it was utilized the instrument called *Cancer Appetite and Symptom Questionnaire* (CASQ), initially proposed in English by Halliday et al.[9] In the present study, it was utilized the version in Portuguese[10], formed by ten items with responses presented in scale type *Likert* of five scores, except item 12 (in relation to "pain")) that has six response score responses . It is worth mentioning that the instrument has four items with scale of inverted response and that the version in Portuguese does not use items five and six of the original instrument.

It was performed the calculation of the global score of appetite and symptoms utilizing the equation proposed by the same authors[10], as shown in Figure 1, where the patients were categorized as "low appetite impairment" (*score* ≤1), "moderate appetite impairment" (*score* 1-3) and "severe appetite impairment" (*score* >3).

Global Appetite Score
$$= 0{,}171\ it1 + 0{,}125\ it2 + 0{,}026\ it3 + 0{,}138\ it4 + 0{,}153\ it7 \\ + 0{,}084\ it8 + 0{,}117\ it9 + 0{,}047\ it10 + 0{,}101\ it11 + 0{,}053\ it12$$

Figure 1. Equation of the global appetite score
Caption: it: item

For the assessment of the nutritional status, it was utilized the Global Subjective Assessment (GSA) proposed by Ottery[11] and matched culturally to Portuguese by Campos et al.[12]. The nutritional status was evaluated according to the original proposal of Ottery[11], the individuals were categorized in "well nourished (A)", "moderately nourished or suspicion of malnourishment (B)" and "severely malnourished (C)".

In order to complement this assessment, it were considered anthropometric measures weight (kg) and height (cm) for further calculation of the Body Mass Index (BMI) (kg/m²). The adult patients were classified according to the cut-off established by the *World Health Organization*[13] and for elders, it were considered the cut-offs proposed by Lipschitz[14].

The *International Business Machines Corporation - Statistical Package for the Social Sciences* (IBM *SPSS® Statistics)* (v.22, *SPSS An IMB Company*, Chicago, IL) was utilized to analyze the data. Initially, it was performed the descriptive analysis of the data. For the comparison study of the mean scores of global health scores and HRQOL among the sociodemographic and clinical variables, nutritional status and appetite impairment, it was utilized the test *t* of Student to compare the means among the independent variables where there were two categories and analysis of variance (Anova) to compare the means when there were variables with three or more categories.

It was performed a linear regression univariate and multiple analysis to verify whether the sociodemographic, clinical and nutritional status variables and appetite impairment were able to predict the HRQOL. The scales (domains) of the instrument EORTC/QLQ-C30 were considered as dependent variables in the regression model. The main outcome was the dependent variable global health and QL (items 29 and 30 of the instrument).

For all the analyzes, it was considered the level of significance of 5% ($p < 005$).

This study was approved by the Institutional Review Board with Human Beings, number CAAE: 73621317.7.0000.5160 and report number 2.287.209.

RESULTS

Of this study, 110 oncologic patients in clinical treatment participated, being 53 adults with mean age of 47.3 years (standard deviation = 9.39) and 57 elders with mean age of 71.0 years (standard deviation = 8.49). The majority were females (62.72%) married (70.0%), not working (51.82%) and classified as economic class B (54.54%).The most prevalent type of cancer in this population was breast cancer (300%), with staging IV (34.44%) and no metastasis (53.64%).

The mean score of appetite impairment of the patients was 1.29 ± 0.64, being classified with moderate appetite impairment.

In Table 1, it was presented the comparison of the means of global health and QL of the patients according to the variables investigated.

When global health and QL were evaluated according to the clinical and sociodemographic variables, it was observed that there were no statistical difference among the groups. While comparing the means of global health and QL according to the variables of the nutritional status determined by SGA, it was noticed that the patients presented significant statistical difference between the

Table 1. Comparison of the means of global health and QL means according to sociodemographic, clinical, nutritional status and appetite impairment

| Variables | | Global Health /QL[a] | | |
	nᵇ	Mean ± standard-deviation	p
Sociodemographic			
Age Range			0.291
Adult	53	78.62±16.38	
Senior	57	74.41±24.59	
Gender			0.071
Male	41	71.75±21.96	
Female	69	79.23±20.14	
Marital Status			0.857
Single	10	81.67±19.95	
Married	77	75.54±21.30	
Separated/Divorced	8	77.08±11.57	
Labor			0.890
No	57	76.17±23.85	
Yes	53	76.73±17.78	
Economic Class			0.307
A	17	82.84±16.79	
B	60	74.58±19.97	
C	31	77.69±23.41	
D and E	2	58.33±47.14	
Clinic			
Type of Treatment			0.729
Chemotherapy	88	75.09±22.12	
Immune therapy	9	79.63±16.20	
Hormone therapy	2	87.50±5.89	
Chemotherapy and immune therapy or hormone therapy	7	83.33±18.63	
Others	4	81.25±14.23	
Diagnostic Groups			0.953
Digestive System	17	76.96±17.06	
Respiratory System	6	73.61±25.50	
Bones and joints	3	72.22±19.24	
Breast	33	80.55±20.80	
Female genital system	8	67.71±29.36	
Male genital system	11	74.24±23.99	
Urinary system	3	86.11±24.06	
Endocrine genital system	9	77.78±15.59	
Lymphoma	7	73.81±21.21	
Myeloma	5	78.33±31.51	
Melanoma	3	72.22±25.46	
Others	5	68.33±14.91	
Clinical Staging			0.070
I	18	79.17±19.85	
II	14	85.71±16.48	
III	27	78.09±19.49	
IV	31	68.82±24.24	
Presence of Metastasis			0.374
No	59	78.11±18.10	
Yes	51	74.51±24.06	
BMI			0.107
Low weight	10	63.33±28.65	
Eutrophic	50	76.83±22.10	
Overweight	50	78.67±17.51	
GSA			0.006*
No risk/well nourished (A)	95	78.60±19.13	
With risk/moderately or severely malnourished (B and C)	15	62.78±27.61	
Low impairment	41	83.33±16.35	
Moderate/severe impairment	69	72.34±22.53	

Captions: QL: quality of life; BMI: body mass index; GSA: global subjective assessment

Notes: [a] Global Health/QL: it were utilized items 29 and 30 of the instrument EORTC/QLQ C30. *p<0.05 test T or Anova; [b] some some information were not found in the charts and/or not responded by the patients (*missing*).

means; patients categorized with nutritional risk B and C had lower mean (62.78±27.61; p=0.006) than the patients without nutritional status (A) (78.60±19.13). This result suggests that the patients who presented some degree of malnourishment had less elevated HRQOL.

It was also observed that the global health/QL of the patients without moderate or severe impairment of the appetite was low and statistically significant (72.34±22.53; p=0.008) when compared to patients who presented low appetite impairment (83.33±16.35). Consequently, it is possible to affirm that for the studied sample, the global health/QL is related to what extent the appetite is impaired and the presence of other symptoms of nutritional impact.

The majority of the patients reported not having difficulty to walk a short distance from home (74.5%), not having to be in bed or in a chair during the day (66.1%), not needing help to feed, bathe or using the restroom (94.5%), no limitations to work or other daily activities (67.1%) and for entertainment or leisure (69.1%). For a substantial portion of the other items that correspond to the functional scales, the response was "no".

In relation to the symptoms investigated by EORTC/QLQ-C30, fatigue, regardless of the grade, was reported by 50.55 of the patients interviewed.

When health in general was evaluated during the last week , 32.7% (n = 36) of the interviewee evaluated their health as excellent and, when asked about the overall QL in the same period of one week, 30.3% (n=33) also affirmed they were in excellent conditions.

In Table 2 are presented the measures of summary of the functional scales, symptoms, global health scale and QL and isolated items of symptoms and financial difficulty.

It is possible to observe that, amidst the functional scales, RP presented the most elevated mean score (76.66 ± 35.13), closer to 100, being, therefore, the less damaged function of the patients of these study. In counterpart, EF was the second most compromised among the patients with mean score equal to 72.85 ± 27.53, after questioned about tension, concern, irritability and depression.

In the scale of symptoms, the most elevated score was shown in the scale of fatigue (30.05 ± 31.94). In the

Table 2. Measures of summary of the functional scales, symptoms, global health scale and QL and isolated items of symptoms and financial impact of the instrument EORTC/QLQ C-30

Scales Functional scales	Mean ± standard-deviation	Minimum	Maximum
PF	73.87±26.62	0.00	100.00
RP	76.66±35.13	0.00	100.00
EF	72.65±27.53	0.00	100.00
CF	76.06±27.69	0.00	100.00
SF	74.24±29.66	0.00	100.00
Scale of symptoms			
Fatigue	30.05±31.94	0.00	100.00
Nausea and vomiting	10.00±20.71	0.00	100.00
Pain	16.66±29.52	0.00	100.00
Dyspnea	9.39±22.18	0.00	100.00
Insomnia	28.48±37.73	0.00	100.00
Appetite	26.36±40.15	0.00	100.00
Constipation	20.30±34.11	0.00	100.00
Diarrhea	14.84±30.48	0.00	100.00
FD	83.33±32.48	0.00	100.00
Global Health Scale/QL	76.44±21.05	0.00	100.00

Captions: PF: physical function; RP: role performance; EF: emotional function; CF: cognitive function; SF: social function; FD: financial difficulty; QL: quality of life.

isolated items, insomnia was the predominant condition, mean score of 28.48 ± 37.73 and, next, loss of appetite (26.36 ± 40.15).

When item FD was evaluated, it was noticed that it presented an elevated score (83.33), demonstrating that the population studied presents financial difficulties provoked by the physical condition and treatment.

In regard to health global scale/QL, the mean score was 76.44 ± 21.05, the patients had the inherent aspects of QL preserved.

The HRQOL associated factors of the patients of this study are presented in Table 3.

The impairment of appetite, it was noticed, presented a significant association at level p < 0.001, with the scales PF, EM and CF.

The impairment of appetite also presented significant relation with the scales of symptoms and isolated items: fatigue (p<0.001), nausea/vomit (p=0.003), pain (p=0.001), dyspnea (p = 0.002), appetite (< 0.001) and financial difficulty (0.049). In addition, the impairment of the appetite presented impact in general health and QL of the patients (p < 0.001), being the only independent variable in the model with significant association in this domain, resulting in a model that explained 53.6% of the global health and QL perceived by the patient.

Other independent variables that presented significant association in the model of regression can be highlighted such as BMI in EF (p<0.001) and symptom of constipation (p=0.019), diagnostic groups and SGA in EF (0.004; 0.013, respectively), the SGA in CF (0.026) and symptom nausea/vomit (p=0.001) and labor in the symptom diarrhea (p=0.029).

DISCUSSION

This study verified that the majority of the patients interviewed, even well nourished, presented moderate or severe impairment of appetite during the clinical treatment of cancer and this should be considered in the assessment of HRQOL. The biggest contribution of this study was to identify and reinforce, in the respective literature, that the impairment of the appetite was a factor associated to global health/QL of the patients with cancer in clinical treatment and, therefore, must be identified early and followed up during the whole course of the treatment. In this study, the nutritional status presented significant association with the scales of EF, CF and nausea/vomit, which are inherent aspects of the HRQOL of the patient in cancer treatment, the majority being investigated by SGA. The nutritional status must be evaluated preferentially with the tool SGA or PP-SGA)[15,16], because, when estimated by BMI, this did not present impact over global health and QL of the patients.

It is worth mentioning that the Brazilian Society of Parenteral and Enteral Nutrition[16] recommends that SGA or PP-SGA be included in the clinical practice of nutritional status of patients with cancer because it is a sensitive instrument to evaluate the nutritional status and diagnose cases of nutritional risk.. In addition, this tool favors the prognosis in order to minimize major complications along the treatment. In this way, the findings of this study confirm that SGA is an essential tool for early identification of the nutritional status of patients submitted to antineoplastic treatment.

To investigate the impairment of the appetite, furthermore and the presence of symptoms of nutritional status is essential across all the phases of the cancer treatment, despite the type of tumor, because appetite changes are common in patients with cancer and bring impact to the patients HRQOL [17].

Another relevant aspect encountered in this study was that EF has been the most damaged among the patients. This occurs, probably, because of the changes that occur in the life of the individual with cancer after the diagnosis is announced and related to clinical treatment itself, especially the chemotherapic, as it can directly affect the emotional aspect since it is a process, most of the times,

Table 3. Factors associated to HRQOL of the participants

	EORTC/QLQ C-30 (dependent variable)									
	Functional Scales									
Independent variables	**PF** R²= 0.423; R² aj= 0.315		**PR** R²= 0.301; R² aj= 0.170		**EF** R²= 0.356; R² aj= 0.236		**CF** R²= 0.308; R² aj= 0.179		**SF** R²= 0.171; R² aj= 0.016	
	β	p	β	p	β	p	β	p	β	p
Continuous variables										
Age	0.02	0.894	0.23	0.188	0.25	0.147	0.04	0.844	0.00	0.988
BMI	-0.11	0.254	0.01	0.953	-0.39	<0.001*	-0.16	0.127	0.02	0.878
Appetite (score)	-0.43	<0.001*	-0.23	0.047	-0.46	<0.001*	-0.47	<0.001*	-0.19	0.119
Categorical variables										
Age group	-0.04	0.782	-0.12	0.492	-0.15	0.360	-0.24	0.166	-0.11	0.545
Gender	-0.03	0.791	0.19	0.121	-0.07	0.518	-0.16	0.172	-0.20	0.123
Marital status	-0.08	0.398	-0.04	0.734	-0.07	0.513	0.10	0.334	0.11	0.347
Labor	0.06	0.581	0.07	0.567	0.02	0.891	0.10	0.397	-0.09	0.450
Economic Class	0.11	0.248	-0.11	0.279	0.07	0.499	-0.02	0.840	0.07	0.526
Type of treatment	-0.07	0.457	0.00	0.971	-0.15	0.135	-0.05	0.632	0.13	0.252
Diagnostic Groups	0.09	0.349	0.20	0.070	-0.31	0.004*	-0.14	0.207	-0.05	0.670
Clinical staging	0.01	0.960	158.00	0.201	0.08	0.490	0.13	0.290	0.15	0.261
Metastasis	-0.06	0.593	-0.09	0.444	-0.12	0.292	-0.14	0.210	-0.08	0.519
SGA	-0.07	0.811	0.15	0.642	0.77	0.013*	0.71	0.026*	-0.11	0.740
	Scale of Symptoms									
	Fatigue R²= 0.399; R² aj= 0.287		**Nausea/vomit** R²= 0.427; R² aj= 0.320		**Pain** R²= 0.219; R² aj= 0.073		**Dyspnea** R²= 0.244; R² aj= 0.103		**Insomnia** R²= 0.159; R² aj= 0.002	
	β	p	β	p	β	p	β	p	β	p
Continuous Variables										
Age	-0.57	0.001	-0.30	0.060	-0.162	0.385	-0.26	0.166	0.33	0.090
BMI	0.10	0.293	-0.03	0.758	0.012	0.911	0.11	0.316	0.16	0.174
Appetite (score)	0.42	<0.001*	0.306	0.003*	0.405	0.001*	0.37	0.002*	0.23	0.072
Categorical variables										
Age group	0.31	0.055	0.05	0.771	0.047	0.797	-0.03	0.889	-0.16	0.390
Gender	-0.01	0.914	-0.08	0.460	-0.22	0.084	-0.06	0.637	-0.01	0.959
Marital Status	0.06	0.530	-0.01	0.958	-0.034	0.766	0.08	0.503	-0.12	0.307
Labor	-0.14	0.203	-0.17	0.111	-0.028	0.818	-0.15	0.212	-0.13	0.306
Economic class	0.08	0.421	0.24	0.012	0.052	0.631	0.10	0.345	0.06	0.622
Type of treatment	0.05	0.596	0.14	0.159	-0.031	0.782	0.17	0.130	-0.02	0.840
Diagnostic Groups	0.01	0.907	-0.05	0.631	-0.084	0.459	-0.06	0.610	-0.05	0.692
Clinical staging	0.01	0.935	0.02	0.895	-0.243	0.064	-0.25	0.053	0.02	0.892
Metastasis	-0.05	0.617	-0.10	0.339	0.148	0.223	0.07	0.541	-0.07	0.591
SGA	-0.06	0.844	0.95	0.001*	-0.142	0.670	-0.02	0.953	-0.36	0.301
	Scale of Symptoms									
	Appetite R²= 0.506; R² aj= 0.414		**Constipation** R²= 0.188; R² aj= 0.037		**Diarrhea** R²= 0.225; R² aj= 0.081		**FD** R²= 0.214; R² aj= 0.067		**Global Health/QL** R²= 0.436; R² aj= 0.330	
	β	p	β	p	β	p	β	p	β	p
Continuous variables										
Age	-0.17	0.242	0.04	0.822	-0.15	0.419	0.28	0.144	0.25	0.118
BMI	0.02	0.789	0.27	0.019*	-0.07	0.555	-0.10	0.364	-0.11	0.270
Appetite (score)	0.67	<0.001*	0.10	0.405	0.09	0.427	-0.24	0.049*	-0.54	<0.001*
Categorical Variables										
Age group	0.02	0.907	-0.31	0.103	-0.13	0.482	-0.11	0.533	-0.12	0.426
Gender	-0.18	0.070	-0.01	0.960	0.03	0.825	0.13	0.295	0.21	0.056
Marital status	0.04	0.687	0.04	0.707	-0.09	0.405	0.11	0.328	-0.04	0.676
Labor	-0.01	0.928	-0.05	0.660	-0.27	0.029*	-0.05	0.668	-0.07	0.505
Economic Class	-0.01	0.958	0.12	0.283	-0.19	0.084	-0.19	0.081	-0.17	0.077
Type of treatment	0.08	0.349	-0.04	0.704	-0.12	0.279	-0.06	0.604	0.02	0.803
Diagnostic Groups	-0.06	0.508	0.05	0.681	-0.08	0.469	-0.02	0.843	-0.07	0.491
Clinical staging	-0.01	0.905	-0.10	0.471	0.26	0.050	0.19	0.158	0.02	0.825
Metastasis	-0.08	0.386	0.07	0.586	-0.07	0.558	-0.02	0.901	-0.15	0.148
SGA	-0.47	0.079	-0.37	0.275	-0.21	0.535	-0.52	0.125	0.11	0.698

Captions: EORTC/QLQ C-30: *European Organization for Research Treatment of Cancer Quality of Life Questionnaire Core 30*; PF: physical function; RP: role performance; EF: emotional function; CF: cognitive function; SF: social function; FD: financial difficulty; QL: quality of life; BMI: body mass index; SGA: subjective global assessment.

long, tiresome and painful[16]. A study conducted by Lobo et al.[18], where the QL of 145 women with breast neoplasm in chemotherapic treatment was evaluated also found the most low mean score for EF (61.32), which corroborates our findings.

In this study, the function with the highest score was RP. This function consists of items 6 ("Did you have limitations to perform your job or other daily activities?") and 7 ("Did you have limitations for leisure or entertainment activities?") of the instrument. This may have occurred because the population studied was interviewed while in the ward and in good nutritional condition according to SGA. These aspects possibly have been important for the majority of the patients who reported they had no difficulty to perform their job, their daily activities or even leisure. Another angle to be considered is that, although the prevalence in this study is of elders, a substantial portion of them did not left their jobs because of illness and/or antineoplastic treatment.

Fatigue is a very common symptom and frequently reported by oncologic patients in several phases of the disease and/or treatment [16,17], especially by those who present the disease at more advanced staging and in chemotherapy treatment. Overall, the patients present persistent feeling of tiredness, including minimum efforts[3]. The scale of fatigue was the one who presented the highest score, consequently, in this study is the symptom that stands out. The majority of the patients interviewed is in stages III and IV of the disease (64.4%) and fatigue is an important characteristic of the advanced cancer and of the patients submitted to chemotherapy treatment (n=88, 80.0%). Cancer-related fatigue is very common because of comorbidities these patients are subject to[19]. A prospective cohort study coordinated by Pearce et al.[20], with 449 individuals followed up during 5.64 months found that 27% of the patients reported fatigue as side effect of the treatment, 85% of the cases confirming the results encountered in the present study.

About the isolated function FD, the mean score was high in these patients, which means that the physical condition and/or medical treatment caused financial problems. Even being a study conducted in a private clinic, which attends health-insured patients, the disease and the treatment impact the financial life of the patient.

Some limitations of this work, as the cross-sectional design, the non-homogeneity of the diagnosis and the types of treatment, and an extremely heterogeneous population in respect to topography are worth mentioning. Therefore, new studies need to be conducted with the objective of continuing the investigations about HRQOL, appetite changes and nutritional status of the patients with cancer. Nevertheless, the initiative of conducting studies with this population

in Brazil's West Central region and the contribution of our findings for the clinical practice of nutritionists and healthcare professionals are the strong aspects.

CONCLUSION

The impairment of appetite was associated to global health and QL of the patients in clinical treatment. Although for this sample the nutritional status evaluated by SGA has not presented association in the model of linear regression whose outcome was general health/QL, it is an aspect to be considered in the models of HRQOL, since it presented significant association with EF, CF, and nausea and vomits.

The sociodemographic and clinical characteristics did not present relation with HRQOL of the patients who were enrolled for this study and/or were not relevant in this sample. More than half of the patients reported some degree of fatigue and this condition has the highest score followed by insomnia and lack of appetite. Regardless the patients' general health and HRQOL are relatively preserved, their EF was more affected.

CONTRIBUTIONS

All the authors participated of all the stages of the manuscript and approval of the final version.

DECLARATION OF CONFLICT OF INTERESTS

There are no declaration of conflicts to declare.

FUNDING SOURCES

None.

REFERENCES

1. Organização das Nações Unidas (BR). Casos de câncer devem aumentar 70% até 2038, calcula OMS [Internet]. Brasília, DF: ONUBR; 2018 fev. 5. [acesso 2019 jul.15]. Disponível em: https://nacoesunidas.org/casos-de-cancer-devem-aumentar-70-ate-2038-calcula-oms/

2. Instituto Nacional de Câncer José Alencar Gomes da Silva. Estima 2018: incidência de câncer no Brasil [Internet]. Rio de Janeiro: INCA; 2017 [acesso 2019 jul. 15]. Disponível em: http://www1.inca.gov.br/estimativa/2018/

3. Guimarães RM, Sousa ALC, Oliveira CM, et al. Avaliação nutricional e da qualidade de vida de pacientes com câncer do aparelho digestório. Saúde Rev. 2016;16(44):63-74. doi: http://dx.doi.org/10.15600/2238-1244/sr.v16n44p63-74

4. Aaronson NK, Ahmedzai S, Bergman B, et al. The European Organization for Research and Treatment of Cancer QLQ-C30: a quality-of-life instrument for use in international clinical trials in oncology. J Natl Cancer Inst. 1993;85(5):365-76. doi: http://dx.doi.org/10.1093/jnci/85.5.365

5. Campos JADB, Spexoto MCB, Silva WR, et al. European Organization for Research and Treatment of Cancer Quality of Life questionnaire core 30: factorial models to Brazilian cancer patients. Einstein (São Paulo). 2018;16(1):eAO4132. http://dx.doi.org/10.1590/s1679-45082018ao4132

6. Soares LC, Burille A, Antonacci MH, et al. A quimioterapia e seus efeitos adversos: relato de clientes oncológicos. Cogitare Enferm. 2009;14(4):714-9. http://dx.doi.org/10.5380/ce.v14i4.16388

7. Poltronieri TS, Tusset C. Impacto do tratamento do câncer sobre o estado nutricional de pacientes oncológicos: atualização da literatura. Rev Bras Cienc Saúde. 2016;20(4):327-32.

8. Associação Brasileira de Empresas de Pesquisa. Critério de classificação econômica Brasil [Internet]. São Paulo: ABEP; 2018 [acesso 2019 jul. 15]. Disponível em: http://www.abep.org/criterio-brasil

9. Halliday V, Porock D, Arthur A, et al. Development and testing of a cancer appetite and symptom questionnaire. J Hum Nutr Diet. 2012;25(3):217-24. doi: https://doi.org/10.1111/j.1365-277X.2012.01233.x

10. Spexoto MC, Serrano SV, Halliday V, et al. Cancer Appetite and Symptom Questionnaire (CASQ) for Brazilian patients: cross-cultural adaptation and validation study. PLoS One. 2016;11(6):e0156288. doi: https://doi.org/10.1371/journal.pone.0156288

11. Ottery FD. Definition of standardized nutritional assessment and interventional pathways in oncology. Nutrition. 1996;12(1 Suppl):S15-9. doi: https://doi.org/10.1016/0899-9007(96)90011-8

12. Campos JADB, Prado CD. Cross-cultural adaptation of the Portuguese version of the patient-generated subjective global assessment. Nutr Hosp. 2012;27(2):583-9. doi: https://doi.org/10.1590/S0212-16112012000200035

13. World Health Organization. Obesity: preventing and managing the global epidemic: report of a WHO Consultation [Internet]. Geneva: WHO; 2000 [cited 15 Jul 2019]. (WHO technical report series; 894). Available from: https://www.who.int/nutrition/publications/obesity/WHO_TRS_894/en/

14. Lipschitz DA. Screening for nutritional status in the elderly. Prim Care. 1994;21(1):55-67.

15. Jager-Wittenaar H, Ottery FD. Assessing nutritional status in cancer: Role of the Patient-Generated Subjective Global Assessment. Curr Opin Clin Nutr Metab Care. 2017;20(5):322-29. doi: https://doi.org/10.1097/MCO.0000000000000389

16. Sociedade Brasileira de Nutrição Parenteral e Enteral. Diretriz BRASPEN de terapia nutricional no paciente com câncer. BRASPEN J. 2019;34(Supl 1):2-32.

17. Campos JADB, Silva WR, Spexoto MCB, et al. Características clinicas, dietéticas e demográficas que interferem na qualidade de vida de pacientes com câncer. Einstein (São Paulo). 2018;16(4):eAO4368. doi: https://doi.org/10.31744/einstein_journal/2018AO4368

18. Lobo SA, Fernandes AFC, Almeida PC, et al. Qualidade de vida em mulheres com neoplasias de mama em quimioterapia. Acta Paul Enferm. 2014;27(6):554-9. doi: http://dx.doi.org/10.1590/1982-0194201400090

19. Arends J, Bachmann P, Baracos V, et al. ESPEN guidelines on nutrition in cancer patients. Clin Nutr. 2017;36(1):11-48. doi: https://doi.org/10.1016/j.clnu.2016.07.015

20. Pearce A, Haas M, Viney R, et al. Incidence and severity of self-reported chemotherapy side effects in routine care: a prospective cohort study. Plos One. 2017;12(10): e0184360. doi: https://doi.org/10.1371/journal.pone.0184360