Nutritional Status and Quality of Life in Individuals with Cancer Assisted by a non-Governmental Organization

Estado Nutricional e Qualidade de Vida em Indivíduos com Câncer Assistidos por Organização não Governamental
Estado Nutricional y Calidad de Vida en Individuos con Câncer Asistidos por Organización no Gubernamental

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Abstract

Introduction: Non-governmental organizations have assumed a complementary role to the health care system for cancer patients. Identification of the particularities of patients assisted by those institutions is necessary for defining better approaches. **Objective:** To analyze the relationship between nutritional status and quality of life in individuals with cancer assisted by a non-governmental organization. **Method:** Cross-sectional study with individuals with cancer, from August to October 2017. A structured questionnaire was applied with socioeconomic information, anthropometric and health conditions. EORTC-QLQ-C30 was used to evaluate quality of life. **Results:** From 163 patients, the majority were female and the most prevalent type of cancer were breast (26%). Most (58.6%) were overweight (39.5% pre-obese and 19.1% obesity, respectively), with breast cancer being more associated with this nutritional status. It was observed that overall quality of life was satisfactory (76.0±20.74), except in emotional function (54.2±32.81). At symptoms scales, the most affected domains were insomnia (41.5±43.84), followed by pain (34.6±36.17) and constipation (32.9±42.55). Malnourished patients had significantly more nausea and vomiting and less diarrhea (p<0.001). Patients with severe weight loss had worse social function and those with moderate weight loss reported greater loss of appetite and diarrhea (p<0.01). **Conclusion:** Nutritional status had an impact on the quality of life of cancer patients assisted by the non-governmental organization, demonstrating the importance of multiprofessional approaches in these institutions that could benefit those patients.

Key words: Neoplasms; Quality of Life; Nutritional Status; Nutrition Assessment; Non-Governmental Organizations.

Resumo

Introdução: As organizações não governamentais têm assumido papel complementar ao sistema de saúde na assistência ao paciente oncológico. A identificação das particularidades dos pacientes atendidos por essas instituições faz-se necessária para que melhores abordagens sejam definidas. **Objetivo:** Analisar a relação entre estado nutricional e qualidade de vida em indivíduos com câncer assistidos por uma organização não governamental. **Método:** Estudo seccional com indivíduos com câncer, realizado de agosto a outubro 2017. Aplicou-se um questionário com informações socioeconômicas, antropométricas e condições de saúde. Para avaliar a qualidade de vida, utilizou-se o questionário EORTC-QLQ-C30. **Resultados:** Dos 163 pacientes, a maioria era do sexo feminino e o tipo de câncer mais prevalente foi o de mama (26%). A maioria (58,6%) apresentava excesso de peso (39,5% sobrepeso e 19,1% obesidade, respectivamente), sendo o câncer de mama o tipo mais associado a esse estado nutricional. Observou-se que a qualidade de vida global foi satisfatória (76,0±20,74), exceto na função emocional (54,2±32,81). Nas escalas de sintomas, os domínios mais afetados foram insônia (41,5±43,84), seguida de dor (34,6±36,17) e constipação (32,9±42,55). Pacientes desnutridos apresentaram significativamente mais náuseas e vômitos e menos diarreia (p<0,001). Pacientes com perda de peso grave apresentaram pior função social; e aqueles com perda de peso moderada relataram maior perda de apetite e diarreia (p<0,01). **Conclusão:** O estado nutricional teve impacto na qualidade de vida dos indivíduos com câncer, assistidos pela organização não governamental, demonstrando a importância de abordagem multiprofissional nessas instituições que possa beneficiar esses pacientes.

Palavras-chave: Neoplasias; Qualidade de Vida; Estado Nutricional; Avaliação Nutricional; Organizações não Governamentais.

Resumen

Introducción: Organizaciones no gubernamentales han asumido papel complementario al sistema de salud en asistencia al paciente oncológico. Identificación de particularidades de pacientes atendidos por esas instituciones se hace necesaria para que se definen mejor enfoques. **Objetivo:** Analizar la relación entre estado nutricional y calidad de vida en individuos con cáncer asistidos por una organización no gubernamental. **Método:** Estudio seccional con individuos con cáncer, en el período de agosto a octubre de 2017. Se aplicó un cuestionario con informaciones socioeconómicas, antropométricas y condiciones de salud. Para evaluar la calidad de vida se utilizó el cuestionario EORTC-QLQ-C30. **Resultados:** De los 163 pacientes, la mayoría era del sexo femenino y el tipo de cáncer más prevalente fue de mama (26%). La mayoría (58,6%) presentaba exceso de peso (39,5% sobrepeso y 19,1% obesidad, respectivamente), siendo el cáncer de mama más asociado a ese estado nutricional. Se observó que la calidad de vida global fue satisfactoria (76,0±20,74), excepto en la función emocional (54,2±32,81). En las escalas de síntomas, los dominios más afectados fueron insomnio (41,5±43,84), seguida de dolor (34,6±36,17) y constipación (32,9±42,55). Los pacientes desnutridos presentaron significativamente más náuseas y vómitos y menos diarrea (p<0,001). Los pacientes con pérdida de peso grave presentaron una peor función social y aquellos con pérdida de peso moderada reportaron mayor pérdida de apetito y diarrea (p<0,01). **Conclusión:** El estado nutricional tuvo impacto en la calidad de vida de los individuos con cáncer asistidos por la organización no gubernamental, demostrando la importancia de enfoque multiprofesional en esas instituciones que puedan beneficiar a esos pacientes.

Palabras clave: Neoplasias; Calidad de Vida; Estado Nutricional; Evaluación Nutricional; Organizaciones no Gubernamentales.

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INTRODUCTION

The processes of urbanization and industrialization increased the exposure to risk factors such as changes of eating habits, practice of physical activity and body composition, resulting in the raise of incidence of non-transmissible chronic diseases like cancer [1,2].

Currently, cancer is considered a world health problem because it affects all social classes and economic regions worldwide[3]. According to the estimates of "Instituto Nacional de Câncer José Alencar Gomes da Silva (INCA)", in 2018 and 2019, it is expected the occurrence of 600 thousand new cases of cancer for each year[4]. In the country, around seven million people die annually of this disease and 16 million deaths are anticipated[1]for 2020.

Face to the magnitude of cancer, it is necessary to acknowledge factors that may be associated to the improvement or worsening of the quality of life (QL) of individuals, granting the planning of actions and helping to evaluate the treatments and interventions [5,6].

Surgery, radiotherapy and chemotherapy, the principal modalities of cancer treatment as well as the location of the tumor may echo in the nutritional profile and induce alterations of individual's metabolic status. Tumor can compete for nutrients and lead to abnormalities in the metabolism of macro and micronutrients and, consequently, provoking negative impact in the QL of the individual[7-9].

Ravasco et al., in a randomized study with 271 patients found that the impact of the nutritional status in the QL turned out to be more important than the staging of the disease in some diagnoses[10]. Similarly, Wallengren, Lundholm and Bosaeus[11] verified that weight loss was one of the criteria more strongly and consistently associated to adverse QL and functional reduction in oncologic patients. In a systematic review to verify the relation between the nutritional status and the QL in patients with cancer, it was observed that the nutritional status was a strong predictor of QL[12].

In Brazil, researches conducted in oncologic services with individuals with cancer receiving chemotherapy, related the low nutritional status to a worst QL[8,13].

However, studies involving the nutritional assessment and QL in patients assisted by non-governmental organizations (NGOs) are yet scarce, specially in what concerns the Brazilian population, even when the action of these institutions is essential to help and follow up oncologic patients in Brazil [14,15]. Considering that the care to the oncologic patient is highly complex, with elevated costs for the health system, the NGOs have assumed a complementary role to the government, while they offer a space for full care providing options of comfort and rest, proper food, attention and socialization for individuals who search for treatment out of their origin city. Usually, these NGOs follow holistic approach, which contributes to improve the QL of the individuals; the control of the nutritional risk is a quite valued action within the activities of the NGOs that work with oncologic patients.

Thus, the identification of the particularities of the patients attended by the NGOs is necessary for a better definition of improved approaches to benefit these patients, since the initiatives of the State are fairly incipient in that direction. Therefore, the study had the aim to analyze the nutritional status and the QL of individuals with cancer cared by one NGO and verify the relation between these aspects.

METHOD

Quantitative-approach epidemiologic sectional study (individuated, observational and transversal) carried out with a sample of individuals with cancer who were attended by a non-profit, non-political non-religious NGO support unit that provides assistance to individuals with cancer of a municipality in the south of Minas Gerais, Brazil [16].

The data were collected between August and October 2017. Individuals with cancer, of both genders, older than 18 years, regardless of diagnosis were included. Individuals in terminal state, where no anthropometric measures were taken because of their conditions, within the international reference standards, and those who did not accept to participate were excluded. Upon clearly informed and clarified about the objectives of the study, the participants signed the Informed Consent Form.

Data collection was carried out with the application of a structured questionnaire with information about demographic and socioeconomic aspects (age, gender, education, family income and place of residence), anthropometric measures (weight, height) and health status (type of cancer and treatment). To classify the nutritional status, it was calculated the Body Mass Index (BMI), utilizing the cut-off recommended by the World Health Organization (WHO)[17] and adopted by the Ministry of Health[18]. The percent of weight loss (WL) calculated by the formula (present weight – original weight/original weight X 100) was classified according to Blackburn et al.[19], being considered significant loss (severe) when higher or equal to 5% of weight loss in one month; or higher or equal to 7.5% in three months or higher or equal to 10% in six months.

To evaluate QL, it was used the questionnaire EORTC-QLQ-C30 (*Quality of Life Questionnaire*), of the European Organization of Research and Treatment of Cancer

Treatment [20]. The questionnaire consists of 30 questions comprehending 5 functioning scales: physical, cognitive, emotional, social and functional performance; three scales of symptoms: fatigue, pain, nausea and vomits; one item of evaluation of financial impact of the treatment and of the disease; five items that evaluate symptoms commonly related to oncologic patients: dyspnea, insomnia, loss of appetite, constipation and diarrhea; and, lastly, a scale of general health status/QL.

The data were stored in Excel and later analyzed through the software *Stata* version 13.0. In the descriptive analysis of the data, it were estimated distributions of frequency, means and standard deviation for the continuous variables of the study and proportions for the categorical variables. *Shapiro Wilk* test was utilized to verify the adherence of the data to normality. Anova and *Student t test* were utilized to compare the means of QL among the anthropometric variables. The level of significance of 5% was adopted for all the tests utilized.

This study is part of a broader research entitled "In pursue of cure: the therapeutic for the person with cancer", approved by the Institutional Review Board (IRB), number CAEE: 54701116.0.0000.5142 and the procedures complied with IRB ethical standards of the institution for human beings who consented with the research, with the Declaration of Helsinki (last version 2013) and with Resolutions number 466/2012 and number 510/2016 of the National Health Council.

RESULTS

Of the 163 cancer affected individuals studied, it was observed that 62.0% were females. The average age was 57.4% (±13.6) years and great part (52.1%) were in the age range between 20 and 59 years. The large majority (77.9%) lived out of the municipality of Alfenas. As for education, 59.5% of the individuals reported less than eight years of study. The family income reported was R$1.342,19 (± R$ 996,99) *reais*. Of the individuals studied, 42.9% were in clinical follow up (they were not on oncologic treatment at the moment) and 25.1 % were on chemotherapy treatment. The most prevalent types of cancer were breast and digestive organs, 25.8% and 16.6%, respectively.

As for nutritional status, the average BMI was 26.3% (±6,25) kg/m^2 and 6.8% were classified as malnourished, while 58.6% were above the weight, being 39.5% overweight and 19.1%, obesity, respectively. However, it was verified a significant or severe percent of weight loss in 15.3% of the individuals studied. Despite the sample difference in each type of tumor, it can be observed in Figure 1 higher prevalence of low weight in individuals
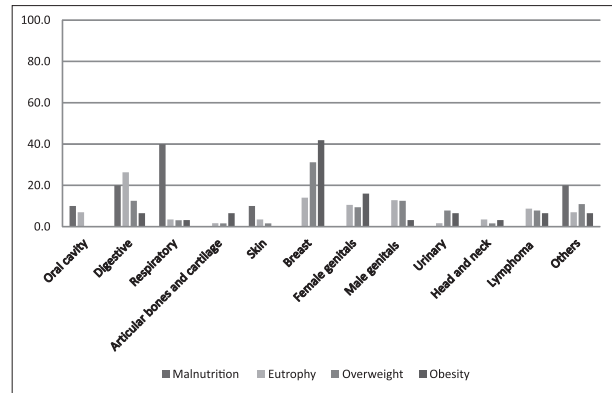

Figure 1. Nutritional status according to BMI in different types of tumors of individuals with cancer cared by a NGO in a Southern municipality in the State of Minas Gerais, Brazil, 2017

with neoplasm of digestive organs and respiratory system, while the major rate of excess of weight was in individuals with mammary neoplasm.

It was noticed that global QL was satisfactory (76.0±20.74), as in all the domains, except emotional functioning (54.2±32.81). In the scales of symptoms, the most affected domains were insomnia (41.5±43.84), followed by pain (34.6±36.17) and constipation (32.9±42.55) (Table 1).

Table 1. Quality of Life of individuals with cancer care by a NGO in a Southern municipality of Minas Gerais, Brazil, 2017

Items of the scale	x (± standard-deviation)
General health status/Quality of life	76.0±20.74
Functioning Scales	
Physical Function	69.2±23.73
Performance of role	67.7±36.93
Emotional Function	54.2±32.81
Cognitive Function	71.6±31.31
Social Function	75.9±29.29
Symptoms Scale	
Fatigue	31.9±30.89
Nausea and vomits	14.6±22.66
Pain	34.6±36.17
Dyspnea	22.3±34.75
Insomnia	41.5±43.84
Loss of appetite	29.0±38.34
Constipation	32.9±42.55
Diarrhea	13.7±28.6
Financial difficulties	27.0±37.14

When QL scores were compared per gender, worst scores were physical, emotional and cognitive functioning in females, being this difference statistically significant (p<0.001). Similarly, in the scales of symptoms, the female patients presented insomnia (p<0.001), constipation (p=0.010) and diarrhea (p=0.048).

Table 2 presents the relation between nutritional status evaluated by BMI and QL. Malnourished patients presented significantly more nausea and vomit and less diarrhea (p<0.001).

Concerning the mean of the QL score according to weight loss, the individuals with severe weight loss presented the worst scores in the social scale. In the scale of symptoms, the individuals with moderate weight loss presented worst loss of appetite and diarrhea (p<0.05) (Table 3).

While comparing QL mean scores with the type of cancer, the individuals with bone and cartilage neoplasm presented better health general status, while the worst status was encountered in individuals with neoplasm of thyroid and other endocrinal glands (p=0.019). In relation to the symptoms, the individuals with neoplasm of thyroid and other endocrinal glands, followed by those with melanoma and neoplasm of the respiratory system presented bigger loss of appetite (p<0.001). The diarrhea was the most common problem in individuals with neoplasms of the digestive system, followed by neoplasm of female genital organs (p<0.001).

DISCUSSION

The present study analyzed the nutritional status and QL of individuals with cancer cared by an NGO in a municipality of the south of Minas Gerais, Brazil. The majority of the individuals included in the sample were females, reflecting the type of cancer predominant (breast neoplasm).

The substantial number of individuals coming from other municipalities of the region can be explained by the characteristics of the facility, which grants resting rooms and social conviviality, proper food to the individuals in oncologic treatment, in addition to guidances from a multidisciplinary team[16].

In this study, patients with neoplasms of digestive organs and of the respiratory system had higher level of malnourishment, consistent with what was observed by other investigators[2,21-23]. Malnourishment may be the result of more energy expenditure, difficulties of food intake, plus the side effects like vomits, nausea and pain caused by the therapy adopted in the treatment[24], as evidenced by the findings of this study. Still, the results showed that such symptoms were significant for obese individuals.

For individuals with overweight, breast neoplasm was the most present diagnosis, a similar result to what was reported in other studies that evaluated the nutritional status of women with mammary carcinoma [25-27]. A possible explanation for this finding can be the relation

Table 2. Scores of Quality of Life according to the nutritional status of patients with cancer cared by a NGO in a Southern municipality of Minas Gerais, Brazil

| Nutritional Status | Nutritional Status | | | | P |
	Malnutrition (n=10)	Eutrophy (n=57)	Overweight (n=64)	Obesity (n=31)	
General health status/Quality of life	68.3±6.43	80.0±2.42	75.4±2.76	72.3±3.95	0.507
Functioning Scales					
Physical Function	78.7±5.24	74.5±3.02	68.7±2.84	59.6±4.27	0.667
Performance of role	66.7±13.38	72.2±4.83	73.4±4.13	50.0±6.87	0.654
Emotional function	48.3±12.28	55.7±3.87	54.9±4.53	50.3±5.39	0.302
Cognitive function	73.3±8.31	73.7±4.43	75.3±3.69	59.1±5.56	0.709
Social function	60.0±9.36	73.9±3.96	78.6±3.68	79.6±4.87	0.944
Symptoms Scales					
Fatigue	24.4±7.73	30.9±4.01	30.4±4.01	36.9±5.36	0.077
Nausea and vomits	25.0±12.73	12.9±2.89	14.8±2.68	12.9±3.34	**<0.001***
Pain	50.0±12.91	28.1±4.53	32.5±4.30	44.6±7.14	0.699
Dyspnea	16.7±10.24	20.5±4.15	20.8±4.29	27.9±7.26	0.443
Insomnia	30.0±12.61	36.3±5.79	41.7±5.51	55.9±7.79	0.986
Loss of appetite	53.3±13.33	29.8±5.39	25.5±4.37	24.7±6.55	0.657
Constipation	43.3±13.19	28.6±5.43	28.6±5.35	44.1±7.79	0.985
Diarrhea	3.3±3.33	15.2±4.26	14.1±3.54	13.9±4.83	**<0.001***
Financial difficulties	46.7±14.22	30.4±5.29	22.4±4.33	24.7±5.98	0.460

Caption: *Value of *p* obtained through the test Anova.

Table 3. Scores of Quality of Life according to weight loss of individuals with cancer cared by a NGO in a Southern Municipality of Minas Gerais, Brazil, 2017

Items of the scale	Weight loss				P
	Without loss (n=84)	Mild (n=54)	Moderate (n=21)	Acute (n=4)	
Health general status/Quality of life	76.7±21.29	73.5±21.48	78.9±17.80	81.2±14.23	0.665
Functioning Scales					
Physical Function	66.7±25.36	72.9±22.03	69.5±22.66	68.3±13.74	0.523
Performance of a role	69.2±36.36	71.3±37.11	54.8±35.02	54.2±53.36	0.289
Emotional function	56.5±33.03	51.7±32.35	46.4±33.08	79.2±25.00	0.238
Cognitive function	74.4±28.51	72.8±33.22	57.1±34.79	70.8±34.36	0.155
Social function	79.6±27.18	78.1±27.44	61.1±36.64	45.8±20.97	**<0.001***
Scale of symptoms					
Fatigue	28.3±29.24	30.4±30.46	48.7±33.05	38.8±42.07	0.052
Nausea and vomits	15.1±24.63	12.0±16.64	19.8±27.70	12.5±25.00	0.600
Pain	71.9±17.42	68.9±14.69	63.4±9.85	63.3±5.45	0.112
Dyspnea	19.8±33.58	26.5±35.69	25.4±39.31	0±0	0.388
Insomnia	40.5±42.69	41.9±44.48	46.0±48.85	33.3±47.14	0.938
Loss of appetite	19.4±33.21	32.7±38.57	57.1±42.35	33.3±47.14	**<0.001***
Constipation	32.9±43.44	34.6±42.94	31.7±41.47	16.7±33.33	0.879
Diarrhea	10.7±23.23	11.7±26.03	33.3±45.95	0±0	**<0.001***
Financial difficulties	21.0±35.01	29.0±38.33	42.9±36.73	41.7±50.00	0.078

Caption: *Value of p obtained through the test Anova.

of inappropriate food intake, alteration of the baseline metabolic rate, restriction of the physical activity and/or menopausa[24]. Another hypothesis would be the nutritional status prior to the clinical diagnosis, i.e., these patients had overweight.

The satisfactory QL encountered in this work corroborates other studies, which utilized the same evaluation instrument[28-30]. The good evaluation of the overall QL in this study is probably related to the clinical follow-up phase the majority of the patients was undergoing, they were not in any oncologic treatment at the moment, which can significantly affect the individual's QL. In addition, the nature of the activities developed by the NGO can, at some level, positively influence the QL of the population under its care.

The emotional functioning was the only domain characterized as unsatisfactory, which reinforces the necessity of the NGOs and of other health providing systems which care for these patients, of intensely promoting qualified listening, humanized welcoming, safety and development of bonds of empathy.

Insomnia, pain and constipation were the most reported symptoms, respectively. A similar study reported fatigue, pain, insomnia and loss of appetite as the most reported symptoms[3]. Insomnia is a common disorder in oncologic patients and can be explained by the concern with the disease and anxiety with the treatment[31], which reflects the negative impact in the emotional functioning of these individuals. Still, the pain can be caused by the

disease own progress associated to invasive procedures and treatment and it was observed a prevalence of the chronic pain ranging from 30% to 50% in these individuals[3]. Constipation is frequently reported in individuals with cancer that use opioids for pain control and probably bears relation between the prevalence of these two symptoms[32].

Comparing QL scores per gender, similar results were reported by Nicolussi et al.[33] who observed worst scores of the cognitive functioning in females. Another study with individuals with colorectal cancer also found worst scores of the emotional and cognitive scales in females[28]. In a longitudinal study conducted by Salas et al.[34], to evaluate the nutritional status and QL of the individuals in chemotherapy, it was not encountered any association between QL and gender.

The data of this study corroborate the findings of the literature for the relation between nutritional status and QL. In a study with 42 patients with colorectal cancer, it were not found differences between health global condition and functioning scales in malnourished and well-nourished patients[35]. However, significant differences were verified for symptoms of fatigue (p<0.01), nausea and vomit (p<0.05), and pain (p<0.001). Likewise, other authors who evaluated the influence of the nutritional status over QL of individuals with cancer observed that the mean score of overall health/QL did not vary significantly according to the nutritional status[36,37].

Pastore, Oehlschlaeger and Gonzalez[13] encountered worst nutritional status associated to lower QL scores

in patients with cancer of the gastrointestinal tract and lung in chemotherapy. Similarly, a research carried out with patients in chemotherapy in a university hospital in Pelotas (RS), malnourished patients had lower scores of QL in all domains, but only in physical functioning were significantly lower than in well-nourished individuals[8].

Lis et al.[12], in a systematic review, also observed that the majority of trials that evaluated the nutritional status and QL in different types of cancer found association between malnourishment and reduction of QL. In 152 oncologic patients with risk of malnutrition, the scores of the subscale EORT QLQ-C30 for function were lower, while the scores of fatigue, pain, dyspnea, insomnia and anorexia were higher in patients that were not at risk of malnourishment ($p<0.05$)[38]. Similarly, Aredes, Garcez and Chaves[39] encountered significant reduction of QL according to the worsening of the nutritional status in 49 women diagnosed with cervical cancer.

As for weight loss, the relation between weight loss and worst QL corroborates the data of the study with 1,555 ill persons with esophageal, gastric, pancreatic and colorectal cancer[40]. Wallengren, Lundholm and Bosaeus[11] reported that both weight loss and BMI were associated to worst QL.

The major limitation of this study is its cross-sectional aspect, which does not allow to establish associations of cause and effect of the data collected and, consequently, of the results obtained. It is suggested that longitudinal trials to understand and evaluate the association between QL and nutritional status of patients with cancer should be carried out. Another limitation would be the narrow scenario of one NGO of a municipality of south of Minas, Brazil. Nonetheless, studies with this population are incipient and the results of this pilot draw attention to the necessity of other trials to be conducted in this area.

The use of BMI to evaluate the nutritional status may be criticized, since it does not take into account the different body compartments. Nevertheless, it is worth mentioning that, among the methods of anthropometric evaluation, BMI is the most utilized parameter of nutritional screening because of the practicality of the evaluation, which facilitates the comparison among the studies.

CONCLUSION

In face of the important alterations cancer induces either in the nutritional status or in the QL of the patients, studies that evaluate the relation of these two aspects are necessary. Yet, because of the emphasis NGO are gaining in providing care to individuals in oncologic treatment, more researches in this area are justified.

According to this study, it was noticed that the nutritional status impacted the QL of the individuals with cancer cared by NGOs, showing the importance of the multiprofessional approach in these institutions that can benefit these patients. So, to materialize the attention to health and promotion of the QL of persons with cancer, actions involving managers and services and integration of the healthcare units are necessary.

CONTRIBUTIONS

Sheilla de Oliveira Faria and Daniela Braga Lima worked in the conception and design of the article; analysis and interpretation of the data as well as wording, critical review of the manuscript and final approval of the version for publication. Mayra Marcela Ribeiro Simião and Fabiana Azevedo Alves worked in collection and analysis of the data and wording, critical review of the final version for publication. Tábatta Renata Pereira de Brito worked in the analysis and interpretation of the data and approval of the final version for publication. Eliane Garcia Rezende worked in the conception and design of the manuscript and final approval of the version for publication.

DECLARATION OF CONFLICT OF INTERESTS

Nothing to declare.

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REFERENCES

1. Instituto Nacional de Câncer José Alencar Gomes da Silva. Estimativa 2014: incidência de câncer no Brasil. Rio de Janeiro: INCA; 2014.

2. Brito LF, Silva LS, Fernandes DD, et al. Perfil nutricional de pacientes com câncer assistidos pela casa de acolhimento ao paciente oncológico do sudoeste da Bahia. Rev Bras Cancerol. 2012;58(2):163-171.

3. Miranda TV, Neves FMG, Costa GNR, et al. Estado Nutricional e Qualidade de Vida de Pacientes em Tratamento Quimioterápico. Rev Bras Cancerol. 2013;59(1):57-64.

4. Instituto Nacional de Câncer José Alencar Gomes da Silva. Estimativa 2018: incidência de câncer no Brasil. Rio de Janeiro: INCA; 2018.

5. Vieira AR, Fortes RC. Qualidade de vida de pacientes com câncer gastrointestinal. Com Ciências Saúde. 2015;26(1/2):45-56.

6. Freire MEM, Sawada NO, França ISX, et al. Qualidade de vida relacionada à saúde de pacientes com câncer

avançado: uma revisão integrativa. Rev Esc Enferm USP. 2014;48(2):357-367. doi: http://dx.doi.org/10.1590/S0080-6234201400002000022.

7. Alshadwi A, Nadershah M, Carlson ER, et al. Nutritional considerations for head and neck cancer patients: a review of the literature. J Oral Maxillofac Surg. 2013;71(11):1853-1860. doi: https://doi.org/10.1016/j.joms.2013.04.028.

8. Borges LR, Paiva SI, Silveira DH, et al. Can nutritional status influence the quality of life of cancer patients? Rev Nutr. 2010;23(5):745-753. doi: http://dx.doi.org/10.1590/S1415-52732010000500005.

9. Kasvis P, Vigano ML, Vigano A. Health-related quality of life across cancer cachexia stages. Ann Palliat Med. 2019;8(1):33-42. doi: http://dx.doi.org/10.21037/apm.2018.08.04.

10. Ravasco P, Monteiro-Grilo I, Vidal PM, et al. Cancer: disease and nutrition are key determinants of patients' quality of life. Support Care Cancer 2004;12(4):246-252. doi: https://doi.org/10.1007/s00520-003-0568-z.

11. Wallengren O, Lundholm K, Bosaeus I. Diagnostic criteria of cancer cachexia: relation to quality of life, exercise capacity and survival in unselected palliative care patients. Support Care Cancer 2013;21(6):1569-1577. doi: https://doi.org/10.1007/s00520-012-1697-z.

12. Lis CG, Gupta D, Lammersfeld CA, et al. Role of nutritional status in predicting quality of life outcomes in cancer--a systematic review of the epidemiological literature. Nutr J. 2012;11:27. doi: https://doi.org/10.1186/1475-2891-11-27.

13. Pastores CA, Oehlschlaeger MHK, Gonzalez MC. Impacto do estado nutricional e da força muscular sobre o estado de saúde geral e qualidade de vida em pacientes com câncer de trato gastrintestinal e de pulmão. Rev Bras Cancerol. 2013;59(1): 43-9.

14. Goss PE, Lee BL, Badovinac-Crnjevic T, et al. Planning cancer control in Latin America and the Caribbean. Lancet Oncol. 2013;14(5):391-436. doi: https://doi.org/10.1016/S1470-2045(13)70048-2.

15. Kligerman J. A ampliação da assistência oncológica no Brasil. Rev Bras Cancerol. 2000, 46(4):347-349.

16. Associação dos Voluntários Vida Viva de Alfenas. A vida viva: história [Internet]. Alfenas, MG: Vida Viva Alfenas; [2016]. [acesso 2019 fev 13]. Disponível em: http://vidavivaalfenas.org.br/institucional.asp?act=Hist%C3%B3ria.

17. World Health Organization. Physical status: the use and interpretation of anthropometry: report of a WHO Expert Committee. Geneva: WHO; 1995. Report of a WHO Expert Committee. (WHO Technical Report Series; 854).

18. Ministério da Saúde (BR). Orientações para a coleta e análise de dados antropométricos em serviços de saúde: norma técnica do sistema de vigilância alimentar e nutricional - SISVAN. Brasília, DF: Ministério da Saúde; 2011. (Série G; estatística e informação em saúde).

19. Blackburn GL, Bistria BR, Maini BS, et al. Nutritional and metabolic assessment of the hospitalized patient. JPEN J Parenter Enteral Nutri. 1977;1(1):11-22. doi: https://doi.org/10.1177/014860717700100101.

20. 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):365-376. doi: https://doi.org/10.1093/jnci/85.5.365.

21. Fruchtenicht AVG, Poziomyck AK, Reis AM, et al. Estado inflamatório e nutricional em pacientes submetidos à ressecção cirúrgica de tumores do trato gastrointestinal. Rev Col Bras Cir. 2018;45(2):3-11. doi: http://dx.doi.org/10.1590/0100-6991e-20181614.

22. Santos AF, Lima FRS, Maciel MG, et al. Avaliação nutricional de pacientes com câncer gástrico e de outras localizações. Rev Pesq Saúde. 2017;18(1):24-27.

23. Chaves MR, Boléo-Tomé C, Monteiro-Grillo I, et al. The diversity of nutritional status in cancer: new insights. Oncologist. 2010;15(5):523-30. doi: http://dx.doi.org/10.1634/theoncologist.2009-0283.

24. Zhang L, Lu Y, Fang Y. Nutritional status and related factors of patients with advanced gastrointestinal câncer. Br J Nutr. 2014;111(7):1239-1244. doi: https://doi.org/10.1017/S000711451300367X.

25. Ferreira IB, Marinho EC, Custódio IDD, et al. Consumo alimentar e estado nutricional de mulheres em quimioterapia. Ciên Saúde Coletiva. 2016;21(7):2209-2218. doi: http://dx.doi.org/10.1590/1413-81232015217.05412015.

26. Oliveira DR, Carvalho ESC, Campos LC, et al. Avaliação nutricional de pacientes com câncer de mama atendidas no Serviço de Mastologia do Hospital das Clínicas, Belo Horizonte (MG), Brasil. Ciên Saúde Coletiva. 2014;19(5):1573-1580. doi: http://dx.doi.org/10.1590/1413-81232014195.02262013.

27. Bering T, Maurício SF, Silva JB, et al. Nutritional and metabolic status of breast cancer women. Nutr Hosp. 2014;31(2):751-8. doi: http://dx.doi.org/10.3305/nh.2015.31.2.8056.

28. Nicolussil AC, Sawada NO. Qualidade de vida de pacientes com câncer colorretal em terapia adjuvante. Acta Paul Enferm. 2009;22(2):155-161. doi: http://dx.doi.org/10.1590/S0103-21002009000200007.

29. Andrade V, Sawada NO, Barichello E. Qualidade de vida de pacientes com câncer hematológico em tratamento quimioterápico. Rev Esc Enferm USP. 2013;47(2):355-361. doi: http://dx.doi.org/10.1590/S0080-62342013000200012.

30. Lim HS, Cho GS, Park YH, et al. Comparison of Quality of Life and Nutritional Status in Gastric Cancer

Patients Undergoing Gastrectomies. Clin Nutr Res. 2015;4(3):153-159. doi: http://dx.doi.org/10.7762/cnr.2015.4.3.153.

31. Oliveira PI, Pereira CAC, Belasco AGS, et al. Comparação da qualidade de vida de portadores de câncer de pulmão antes e após o tratamento quimioterápico. Rev. Latino-Am Enfermagem. 2013;21(3):[8 telas].

32. Marmo MCR, Caran EMM, Puty FCB, et al. Avaliação do hábito intestinal em pacientes com câncer que utilizam morfina para o controle da dor. Rev Dor. 2012;13(3):243-248. doi: http://dx.doi.org/10.1590/S1806-00132012000300009.

33. Nicolussi AC, Sawada NO, Cardozo FMC, et al. Qualidade de vida relacionada à saúde de pacientes com câncer em quimioterapia. Rev Rene. 2014;15(1):132-140. doi: http://dx.doi.org/10.15253/2175-6783.2014000100017.

34. Salas S, Mercier S, Moheng B, et al. Nutritional status and quality of life of cancer patients needing exclusive chemotherapy: a longitudinal study. Health Qual Life Outcomes. 2017;15(1):85. doi: https://doi.org/10.1186/s12955-017-0660-6.

35. Zaid ZA, Jackson K, Cobiac L, et al. Relationship between quality of life and nutritional status in colorectal cancer patients undergoing chemotherapy. Malays J Nutr. 2017;23(3):375-384.

36. Firnkes R, Pastore CA, Gonzales MC. Influência do estado nutricional sobre a qualidade de vida em pacientes com cânceres de trato gastrintestinal e de pulmão pré-quimioterapia. Rev Bras Nutr Clin. 2014;29(1):26-30.

37. Scheibler J, Silva FM, Moreira TR, et al. Qualidade de vida, estado nutricional e consumo alimentar de mulheres com câncer de mama em tratamento quimioterápico. Rev Bras Promoç Saúde. 2016;29(4):544-553. doi: http://dx.doi.org/10.5020/18061230.2016.p544.

38. Küçükkatirci S, Sahin H, Soylu M, et al. Nutritional status and quality of life in lung cancer patients. Stud Ethno-Med. 2017;11(3):268-277. doi: https://doi.org/10.1080/09735070.2017.1305226.

39. Aredes MA, Garcez MR, Chaves GV. Influence of chemoradiotherapy on nutritional status, functional capacity, quality of life and toxicity of treatment for patients with cervical cancer. Nutr Diet. 2018;75(3):263-270. doi: https://doi.org/10.1111/1747-0080.12414.

40. Andreyev HJ, Norman AR, Oates J, et al. Why do patients with weight loss have a worse outcome when undergoing chemotherapy for gastrointestinal malignancies? Eur J Cancer. 1998;34(4):503-509.