Assessment of Quality of Life and Prevalence of Depressive Symptoms in Oncologic Patients submitted to Radiotherapy

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Avaliação da Qualidade de Vida e Prevalência de Sintomas Depressivos em Pacientes Oncológicos Submetidos à Radioterapia

Evaluación de la Calidad de Vida y Prevalencia de Síntomas Depresivos en Radioterapia en Pacientes Oncológicos

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Abstract

Introduction: The quality of life of cancer patients has been studied in many Brazilian papers. However, despite the high prevalence of individuals undergoing radiotherapy, few studies with emphasis in this group of patients have been identified. **Objective:** To evaluate the quality of life and the prevalence of depressive symptoms in patients with malignant neoplasms undergoing radiotherapy treatment. **Method:** Quantitative cross-sectional study with 153 cancer patients undergoing radiotherapy treatment at an oncology and radiotherapy specialized center, located in the northwest of Paraná state. Data were collected between March and September 2018. The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) and the Beck Inventory were used to assess quality of life and depressive symptoms, respectively. **Results:** The domains "quality of life", "cognitive function" and "social function" were the least affected in the studied sample, while "insomnia", "loss of appetite" and "financial difficulties" stood out among the higher predictors of poor quality of life. In addition, it was found that 22% of the individuals evaluated had some degree of mood disorder, 11% being diagnosed with depression. **Conclusion:** The decline in quality of life and the prevalence of depressive symptoms in cancer patients, even those undergoing radiotherapy, emphasize the importance of early interventions aimed at restoring functionality and well-being.

Key words: Neoplasms/radiotherapy; Neoplasms/psychology; Depression; Quality of Life; Delivery of Health Care.

Resumo

Introdução: A qualidade de vida de pacientes oncológicos tem sido objeto de estudo em muitos trabalhos brasileiros. Contudo, apesar da alta prevalência de indivíduos submetidos à radioterapia, poucos estudos com ênfase nesse grupo de pacientes foram identificados. **Objetivo:** Avaliar a qualidade de vida e a prevalência de sintomas depressivos em pacientes com neoplasias malignas durante o tratamento radioterápico. **Método:** Estudo transversal quantitativo realizado com 153 pacientes oncológicos em vigência de tratamento radioterápico em um centro especializado em oncologia e radioterapia, localizado no Noroeste do Estado do Paraná. Os dados foram coletados entre março e setembro de 2018. O *European Organization for Research and Treatment of Cancer Quality of Life Questionnaire* (EORTC QLQ-C30) e o Inventário de Depressão de Beck foram utilizados para avaliar a qualidade de vida e os sintomas depressivos, respectivamente. **Resultados:** Os domínios "qualidade de vida", "função cognitiva" e "função social" foram os que menos se mostraram prejudicados na amostra estudada, enquanto "insônia", "perda de apetite" e "dificuldades financeiras" destacaram-se entre os maiores preditores de baixa qualidade de vida. Ademais, contatou-se que 22% dos indivíduos avaliados apresentaram algum grau de transtorno de humor, sendo 11% diagnosticados com depressão. **Conclusão:** O declínio na qualidade de vida e a prevalência de sintomas depressivos em pacientes oncológicos, mesmo os em vigência de radioterapia, enaltecem a importância de intervenções precoces que visem a restabelecer a funcionalidade e o bem-estar.

Palavras-chave: Neoplasias/radioterapia; Neoplasias/psicologia; Depressão; Qualidade de Vida; Assistência à Saúde.

Resumen

Introducción: La calidad de vida de los pacientes con cáncer se ha estudiado en muchos estudios brasileños. Sin embargo, a pesar de la alta prevalencia de individuos sometidos a radioterapia, se han identificado pocos estudios con énfasis en este grupo de pacientes. **Objetivo:** Evaluar la calidad de vida y la prevalencia de síntomas depresivos en pacientes con neoplasias malignas sometidas a radioterapia. **Método:** Estudio transversal cuantitativo realizado con 153 pacientes con cáncer sometidos a tratamiento de radioterapia en un centro especializado en oncología y radioterapia, ubicado en el Noroeste del Estado de Paraná. Los datos se recopilaron entre marzo y septiembre de 2018. El *European Organization for Research and Treatment of Cancer Quality of Life Questionnaire* (EORTC QLQ-C30) y el Inventario Beck se utilizaron para evaluar la calidad de vida y los síntomas depresivos, respectivamente. **Resultados:** Los dominios "calidad de vida", "función cognitiva" y "función social" fueron los menos afectados en la muestra estudiada, mientras que el "insomnio", la "pérdida de apetito" y las "dificultades financieras" se destacaron entre los dominios. predictores más altos de mala calidad de vida. Además, se encontró que el 22% de los individuos evaluados tenían algún grado de trastorno del estado de ánimo, y el 11% fue diagnosticado con depresión. **Conclusión:** La disminución de la calidad de vida y la prevalencia de síntomas depresivos en pacientes con cáncer, incluso en aquellos que reciben radioterapia, enfatizan la importancia de las intervenciones tempranas destinadas a restaurar la funcionalidad y el bienestar.

Palabras clave: Neoplasias/radioterapia; Neoplasias/psicología; Depresión; Calidad de Vida; Prestación de Atención de Salud.

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INTRODUCTION

Malignant neoplasms are characterized by the uncontrolled, fast and invasive cellular growth of tissues and organs and are the second main cause of death in the whole world, being responsible for nearly 9.6 million deaths in 2018, behind only of cardiovascular diseases[1]. Among the most incident tumors in Brazilian males, are prostate, lower respiratory airways, lung, colon and rectum cancer. Among women, breast cancer is the most important, above gastrointestinal tract and cervix. Nearly 420 thousand new cases of cancer were estimated for the biennium 2018-2019, except non-melanoma skin cancer[2].

For being multicausal and not distinguishing gender or age, cancer can manifest at any moment, insidiously and abrupt with different presentations[2,3]. It is remarkable the progress of the researches involving since tumor biology until preventive, diagnostic and therapeutic aspects, implying in better prognosis of many tumors[4,5]. Among the therapeutic approaches, radiotherapy is a growing modality and can be adopted isolated or together with chemotherapy with adjuvant, neoadjuvant or even palliative finality. Nearly half of the oncologic patients need this type of therapy in Brazil. It is a high demanded resource with high cost, since the equipment, its maintenance and skilled professionals are costly[6].

At the moment of choosing which therapy to adopt, modality and conformation, it should be taken into account the general status of the patient, size and location of the tumor and its applicability and skill in managing the technique selected. Therefore, radiotherapy can be subdivided in two techniques: teletherapy, where the radiation is applied externally to the patient through gamma rays, x-rays and electron beams; and brachytherapy where the irradiation is introduced internally in the tumor or in its vicinities[7]. Radiotherapy is painless and the patient does not see the application of the rays. However, many are the possible adverse effects, immediate or late[8].

The quality of life of oncologic patients has been object of study in many Brazilian papers, mainly during chemotherapy. However, few studies with emphasis in the patient in radiotherapy treatment were identified[9,10]. Because of the challenges faced by the patients and their families, from the process of diagnosis to the therapy[11-14] and because of the significant impact of the disease over the economy with premature deaths and disabilities[15-17], identify factors for the decline of the patients' well-being can contribute to guide the interventions.

The psychological stress and the mental manifestations can appear even before the diagnosis while the patient is submitted to several investigational exams that usually prolong during the entire execution of the therapeutic planning – it can be short or extends for several years[18,19]. In addition to the impact of the pathology itself, with all its stigmas, changes in the appearance, social life, basic daily activities as nourishment, hygiene, can occur contributing negatively for the psychological status of the patient[20]. The behavioral changes, tendency to isolation or social reclusion can unchain severe conditions of anxiety and/or depressive disorders, transitory or persistent and many times, unnoticed by the professional or relative[14,21].

In that direction, the present study had as objective to evaluate the quality of life and prevalence of depressive symptoms in patients with malignant neoplasms during the radiotherapy treatment.

METHOD

The Institutional Review Board of the University Center of Maringá (UniCesumar), approved the study, CAAE: 81966617.4.0000.5539, report number 2,197,264, in compliance with Resolution 466/12 of the National Health Council.

The period of data collection occurred between March and September 2018, where the patients were interviewed by the investigators while waiting for the radiotherapy session after reading and completing the Informed Consent Form for the participant. The participation was voluntary, and the participants received all the information related to the objectives of the study and the ethical aspects, being ensured the anonymity. The clinical information of the patients were extracted from the respective charts.

Exploratory, descriptive, cross-sectional and quantitative approach study. All the patients in radiotherapy treatment were invited to participate at the Service of the Oncology and Radiotherapy Center Sant'Ana, located in the city of Maringá - PR, during the collection period. The sample was prepared according to the eligibility criteria: age equal or above 18 years and confirmed diagnosis of malignant neoplasm. There were included 153 individuals. No questionnaire was excluded.

The first instrument is the Beck Depression Inventory, which consists in 21 items with a scale of four levels, from 0 to 3 values, where zero implies in absence of symptoms and three, presence of severe symptoms. In it, the following items are evaluated: 1) depressed mood; 2) pessimism; 3) sense of failure; 4) loss of satisfaction; 5) guilt feelings; 6) feeling of punishment; 7) self-rancor (hatred, aversion); 8) self-accusation; 9) suicidal ideation; 10) weeping; 11) irritability; 12) social isolation ; 13) indecision; 14) altered body image; 15) work inhibition; 16) sleeping disorder; 17) fatigability; 18) loss of appetite;

19) weight loss; 20) somatic concerns 21) loss of libido. The scale is graduated with affirmations from 0 to 3, where zero is absence of the symptom and three, the maximum presence of the symptom. The minimum score is zero and the maximum, 63. After the application, it was obtained a total score that is the sum of 21 items, considering the following categories: (1) absence of depression – score from 0 to 15; (2) dysphoria – score from 16 to 20; (3) depression – score from 21 to 63. It is valid to mention that this questionnaire had been interpreted by a dully skilled professional.

The second instrument utilized is the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30). It is a multidimensional questionnaire with 30 questions that plan to evaluate the physical, psychological domain, the level of independence, the social aspect and the environment (financial resources and life at home) and that are divided in three scales and 15 subscales: 1) global health status and quality of life; 2) functional scale consisting of physical functioning, functional limitations as, for instance, succeed in performing normally the daily tasks, emotional functioning, cognitive functioning and social functioning; 3) symptomatic scale formed by the subscales fatigue, nausea and vomiting, pain, shortness of breath, insomnia, lack of appetite, obstipation, diarrhea and financial difficulties. This instrument elaborated by the group EORTC was applied in its Portuguese version, that has been translated and validated, available at the website of this organization. The questions from 1 to 28 have scale in four levels, while items 29 and 30, seven levels. This instrument allows the calculation of the scores and for such, it is estimated an initial raw score given by the arithmetic simple mean of the respective items of a domain.

At first, it was performed a descriptive analysis of the results to obtain frequency charts and tables with the objective of characterizing the individuals. To describe the results, it will be used the absolute frequency and the percentage for the categorical variables. To evaluate the relations between the quantitative variables measured in the study participants, it was utilized the Pearson correlation test. All the analyzes were conducted with the support of the statistical environment R (R Development Core Team), version 3.5.

RESULTS

The sample consisted of 153 individuals of both genders with age varying between 23 and 98, being 40% of the participants older than 60 years.

Figure 1 shows the concentration of the types of cancer where the mode is breast cancer (45.75%), followed by gynecologic types (11.11%) and head and neck (10.46%). In addition, 6.54% of the observations did not present responses.

In relation to the modalities of treatment adopted, it was verified that the majority of the patients of the service, 52% (80) was submitted to adjuvant radiotherapy followed by 20% (31) in the modality curative. The other modalities, as neoadjuvant and palliative, represented less than 10% of the sample. It was observed that the technique

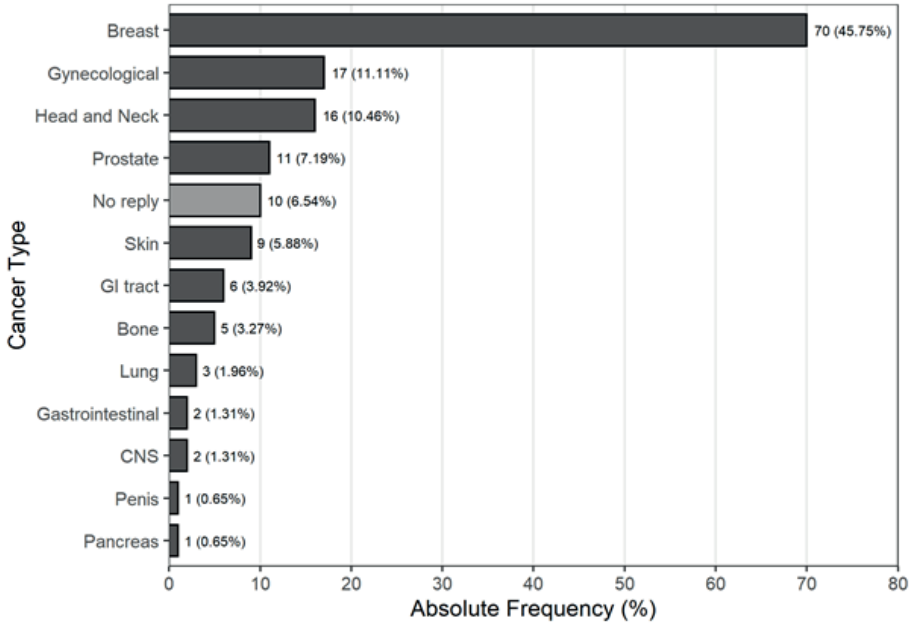

Figure 1. Bar chart of the absolute frequency of the types of cancer

bidimensional 2D was utilized in 55% (84) of the sample followed by the three-dimensional conformal technique 3D-CTR with 24% (36). The other techniques, intensity-modulated radiotherapy (IMRT) and brachytherapy represented less than 5% of the participants. Still, 28 charts did not contain such information in the standard field, probably for being under discussion and therapeutic planning.

After the univariate analysis, it was evaluated the distribution of the types of cancer in each modality of treatment, ignoring the 28 patients that did not respond to at least one of the variables of this modality of treatment, reaching 125 patients (Table 1).

It is noticed that nearly half of the patients (46.7%) with head and neck cancer was submitted to the modality curative, while none, to neoadjuvant. In terms of gynecologic tumors, two modalities are predominant, adjuvant (47.06%) and curative (41.18%).

While evaluating the type of breast cancer, it is observed that nearly all (92.98%) are classified as adjuvant modality and none, curative. Most of them (62.50%) with skin neoplasms was in adjuvant. For prostate cancer, the majority (81.82%) of the patients was submitted to the modality curative.

Considering the data obtained through the instrument EORTC QLC-C30, expressed in Figure 2, where it was evaluated the distribution of the scores as a function of the domains, it is seen that the functional and quality of life domains present high concentration in the highest score category (greater than 90), with emphasis for social and cognitive function, where 50% and 49.66% of the interviewees are in the greatest category, respectively. The other domains present exactly higher concentration in the lower category of the score, being insomnia, loss of appetite and financial difficulties those with more than 10% of the responses with score above 90.

Table 1. Relative frequency (absolute) of the modalities per type of cancer

Modality	Head and Neck	Gynecologic	Breast	Skin	Prostate	Other
Adjuvant	33.33% (5)	47.06% (8)	92.98% (53)	62.50% (5)	9.09% (1)	47.06% (8)
Curative	46.67% (7)	41.18% (7)	-	37.50% (3)	81.82% (9)	29.41% (5)
Neoadjuvant	-	5.88% (1)	3.51% (2)	-	-	5.88% (1)
Palliative	20.00% (3)	5.88% (1)	3.51% (2)	-	9.09% (1)	17.65% (3)
Total	100% (15)	100% (17)	100% (57)	100% (8)	100% (11)	100% (17)

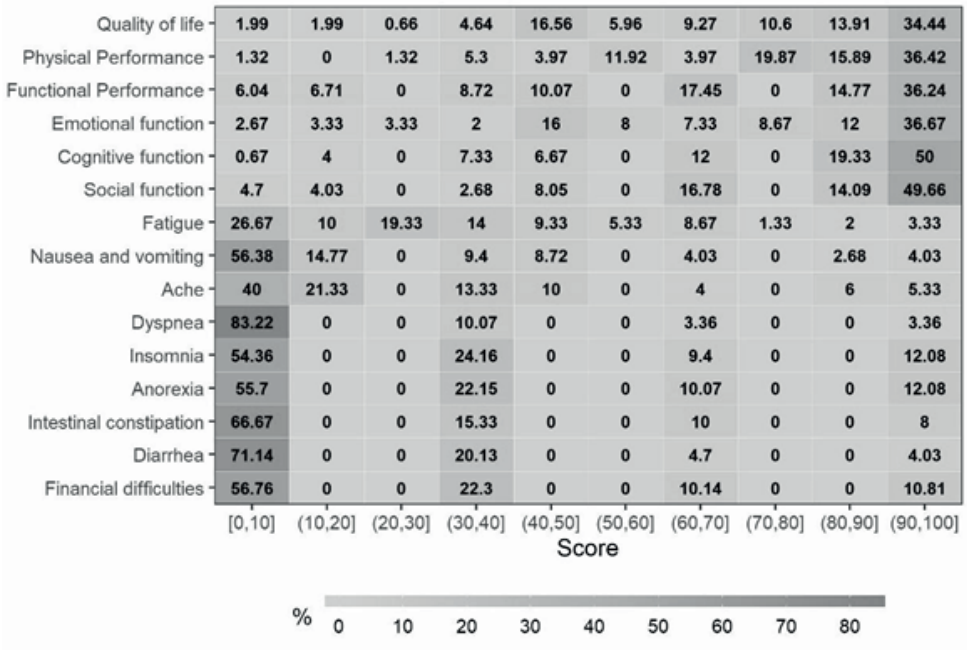

Figure 2. Heat map of the percentage of responses calculated and the domains of the instrument EORTC

The results of the Beck Depression Inventory are exposed in Table 3 with 21 items ordered as greatest severity. The loss of libido presents nearly 40% of the severe responses (quite or very), followed by weight loss and work inhibition. In terms of the items whose severity is low (no or mild), representing the great majority of the responses, it stands out suicidal ideation and self-rancor that present only 1% of the responses with severe levels

Further, it was analyzed the categories from the total score of the instrument. It is observed that the majority of the participants, 78% (119) was categorized with lack of depression, while 11% (17) with dysphoria and the remaining 11% (17) with depression.

Finally, it is evaluated how the relations among the instruments happen, using the correlation between the final score of the Beck Depression Inventory with the score of each domain of the instrument EORTC. It is noticed that the correlations with the functional domains and quality of life are negative, that is, the highest the score of the Beck Depression Inventory, lower is the score, and the emotional functional presents stronger linear negative correlation. The contrary happens with the domains related to the symptoms where the linear correlation is positive: as high the final score of the Beck Depression Inventory, high is the score for these domains.

DISCUSSION

There is an outstanding and multifactorial association between the risk of malignant neoplasms and ageing, where, for the most part of the known cancers, its incidences and rates of mortality increase as age advances[22]. The data found in the present study, however, contradict this affirmation, as much as there was predominance of the age range below 60 years in the sample evaluated, what draws the attention for the high rate of malignant neoplasms in young individuals in this population.

The lowering of the quality of life in oncologic patients can be connected to several conditions as physical and emotional changes, pain, dependence from other, loss of self-esteem and the stigma culturally attached to this morbidity[23]. The prevalence of the depressive disorder among oncologic patients is greater than the one encountered in the general population and these proportions vary expressively among the studies because of the selection of specific samples and use of different evaluation methods[24].

Through the instrument EORTC QLQ-C30, it was observed an elevated score calculated for the item "quality of life" and for the functional domains with emphasis in "cognitive function" and "social function" where, respectively, 50% and 49.6% of the participants obtained scores between 90 and 100, indicating that these spheres were less damaged in these patients. Concurring with this observation, Faria et al.[25], in a study conducted with 163 oncologic patients, using the same instrument of evaluation, have found similarly the highest scores in the item "quality of life" and in the domains "cognitive function" and "social function", with mean of 76, 71.6 and 75.9, respectively. The good perception of the global

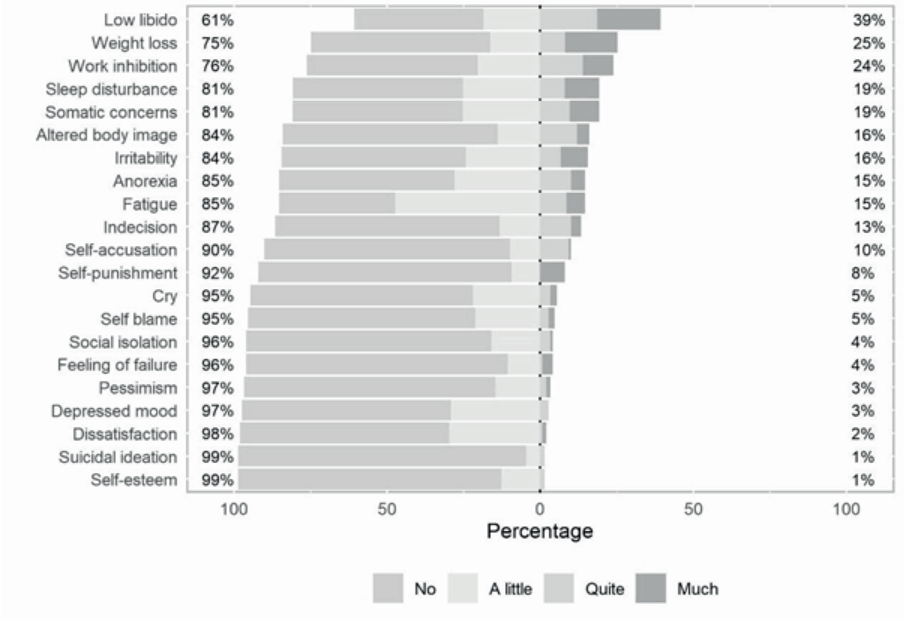

Figure 3. Bar chart of the percentage of each item of Beck Depression Inventory

quality of life in this study can be associated to the quality of the healthcare received by these individuals and to the fact that there is only a small portion of the sample which is in palliative radiotherapy treatment.

Regarding the scale of symptoms, the domains "insomnia", "loss of appetite" and "financial difficulties" deserve to be highlighted for presenting more than 10% of response with score higher than 90, standing out as the greatest predictors of low quality of life. In the study elaborated by Lôbo et al.[26] with 145 women in chemotherapy treatment for breast cancer, the highest scores in the scales of symptoms were for "insomnia", "fatigue" and "loss of appetite" with means of 37.93, 36.01 and 33.56, respectively. In a similar study, Mendez et al.[27] observed that the only topic that registered a significant difference between the scores before and after the beginning of the treatment was the domain "pain", for which the median dropped from 66 to 33 after two months of treatment. These data allow to infer that the implementation of the correct modality of treatment to the oncologic patient, can, admittedly, improve its quality of life. In the present study, 15.3% of the patients reached score calculated ≥50 for the domain "pain", emphasizing the urgent necessity of improvement of the pain control in these patients.

It is known that the diagnosis of cancer and its treatment can highlight pre-existing sleeping problems and trigger new as insomnia that, if left untreated, usually becomes chronic and is consistent with the commencement of fatigue and depression[28]. On its turn, the loss of appetite is a common symptom in oncologic patients and affects nearly 15% to 20% of them, being a result of the alteration of the balance of stimulating neurotransmitters and inhibitors of appetite and is induced by hormones and inflammatory cytokines that reach the arcuate nucleus of the hypothalamus (ARC)[29].

From Beck Depression Inventory, it was verified that 22% of the individuals evaluated presented some degree of mood disorder, being 11% diagnosed with severe depressive disorder. In the literature, rates even higher are observed as referenced by Tsaras et al.[30] in a study with 152 patients diagnosed with breast cancer, whose prevalence of depression was 38.2%. Demonstrating expressive similitude with the data encountered in the present study, Wagner et al.[31], in their study with 455 patients in radiotherapy treatment, with the majority affected by breast cancer, encountered a rate of 10.1% of depression. The diagnosis of depression in oncologic patients is seen as a challenge, since the symptoms related to the neoplasm *per se*, the drugs side effects and the depressive symptoms themselves can overlap[32].

In relation to depression of patients submitted to radiotherapy, Panwar et al.[33] conducted a double-blind, placebo-controlled, randomized clinical trial with patients without depression that were just about to undergo radiotherapy treatment. In the placebo group, 39% of the individuals who received radiation as part of the initial treatment developed depression during the period of the study in comparison with just 12% of the patients who did not receive radiotherapy in this occasion. In a previous study[34], the population that submitted to radiotherapy as initial therapy presented, likewise, the probability significantly greater of developing depression than the patients treated surgically. This strong association between the depression and the radiotherapy as part of the treatment can be explained by the high rate of side effects caused by this therapeutic modality, such as nausea, vomiting, headache, alopecia, dysphagia, xerostomia, temporary loss of taste, inappetence, feeling of weakness, diarrhea and cramps, with variable intensity according to the irradiation site[35].

In this study, the items that received more percentage of responses in Beck Depression Inventory were loss of libido, weight loss and work inhibition. Weight loss may be related to cachexia commonly developed by patients with cancer, resulting from alterations of the energetic metabolism and turnover of muscular proteins[36]. On its turn, the presence of a debilitating disease, the use of drugs that inhibit the libido, surgeries and negative emotional status, many times concomitantly, justify the high prevalence of loss of libido in oncologic patients[37].

CONCLUSION

This study had the objective of evaluating the quality of life and the prevalence of depressive symptoms of the patients with cancer in a specialized center in oncology and radiotherapy located in the Northwest of the State of Paraná. Multiple are the factors that can contribute for the reduction of the quality of life and the increase of the prevalence of depression in this population such as physical changes, emotional alterations, symptoms associated to the disease and its treatment, loss of self-esteem and loss of libido. It is added to this, the tough diagnosis of depression in patients with cancer, since the symptoms of the own neoplasm and those resulting from the pharmacologic treatment can overlap to the depressive disorder.

Through the instrument EORTC QLQ-C30 it was verified that the domains "quality of life", "cognitive function" and "social function" were those that were less harmed in these patients. In the scale of symptoms, the domains "insomnia", "loss of appetite" and "financial

difficulties" presented more than 10% of responses with score over 90, standing out as the greatest predictors of low quality of life.

Based in the Beck Depression Inventory, it was verified that 22% of the individuals evaluated presented some degree of mood disorder, being 11% diagnosed with depression and the items that had the biggest percentage of serious responses were loss of libido, loss of weight and work inhibition.

Since the low quality of life and the highest rates of depression are reality among the oncologic patients, as shown in this and other studies, it was necessary the monitoring of these individuals through appropriate scores, with the objective of early diagnosis and intervention for the reestablishment of functionality and well-being. New studies are necessary to estimate precisely what is the prevalence of these comorbidities, indicate what are the factors associated to them and elaborate a therapeutic plan, with drugs or not, with the possibility of being applied for this population.

CONTRIBUTIONS

Antonio Augusto Claudio Pereira, Nayara de Paula Passarin and Marcel Pereira Rangel participated of the conception and design of the article; gathering, analysis, interpretation of the study data; wording and critical review with intellectual contribution. Jordana Henriques Coimbra participated of the conception and design of the article; gathering, analysis and interpretation of the study data. Gabriela Grasso Pereira participated of the wording and critical review with intellectual contribution. All the authors approved the final version to be published.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interests to declare.

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