

Impact of chemotherapy treatment on the quality of life of patients with cancer

Impacto do tratamento quimioterápico na qualidade de vida de pacientes oncológicos
Impacto del tratamiento de quimioterapia en la calidad de vida de pacientes oncológicos

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Abstract

Objective: To assess the health-related quality of life (HRQoL) of patients with cancer before and three months after starting chemotherapy treatment.

Methods: This is a prospective and exploratory cohort study. An instrument was used for sociodemographic and clinical characterization of patients and another for assessing HRQoL called EORTC QLQ-C30. This instrument consists of functional, symptom, and global health status scales. Seventy-nine individuals attended at an outpatient clinic for chemotherapy. Statistical tests were performed to compare side effects of chemotherapy treatment on quality of life.

Results: The EORTC QLQ-C30 indicated adequate reliability in two assessment moments. Concerning the functional scale, physical functioning and cognitive functioning improved, and emotional functioning worsened after three months of treatment. The symptom scale worsened three months after starting chemotherapy with respect to the symptoms of fatigue, nausea, dyspnea, appetite loss, and diarrhea.

Conclusion: The most affected domains, after three months of chemotherapy treatment, were related to functional and symptom scales' functioning; therefore, multidisciplinary interventions should be implemented for this population in order to control such variables.

Resumo

Objetivo: Avaliar a qualidade de vida relacionada à saúde (QVRS) de pacientes oncológicos antes e três meses após o início do tratamento quimioterápico.

Métodos: Tratou-se de um estudo de coorte prospectivo, exploratório. Foi utilizado um instrumento para caracterização sociodemográfica e clínica dos pacientes e outro para avaliação da QVRS denominado EORTC QLQ-C30, sendo este constituído por três escalas: funcionalidade, sintomas e saúde global. Participaram 79 indivíduos atendidos em um ambulatório para realização de quimioterapia. Testes estatísticos foram realizados para comparar o efeito do tratamento quimioterápico em relação à qualidade de vida.

Resultados: O instrumento EORTC QLQ-C30 indicou adequada confiabilidade nos dois momentos de avaliação. No que tange à escala de funcionalidade, as funções física e cognitiva apresentaram melhora; e a função emocional, piora após três meses do tratamento. A escala de sintomas revelou piora, após três meses do início da quimioterapia, no que diz respeito aos sintomas de fadiga, náusea, dispneia, perda de apetite e diarreia.

Conclusão: Neste estudo, os domínios mais afetados, após três meses de tratamento quimioterápico, estavam relacionados às funções da escala funcional e dos sintomas, portanto, intervenções multiprofissionais devem ser implementadas a esta população visando ao controle de tais variáveis.

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Conflicts of interest: nothing to declare.

Resumen

Objetivo: Evaluar la calidad de vida relacionada con la salud (CVRS) de pacientes oncológicos antes del inicio del tratamiento de quimioterapia y tres meses después.

Métodos: Se trató de un estudio de cohorte prospectivo, exploratorio. Fue utilizado un instrumento para la caracterización sociodemográfica y clínica de los pacientes y otro para la evaluación de la CVRS denominado EORTC QLQ-C30, que está compuesto por tres escalas: funcionalidad, síntomas y salud global. Participaron 70 individuos atendidos en consultorios externos para la realización de quimioterapia. Se realizaron pruebas estadísticas para comparar el efecto del tratamiento de quimioterapia con relación a la calidad de vida.

Resultados: El instrumento EORTC QLQ-C30 indicó fiabilidad adecuada en los dos momentos de evaluación. En lo que atañe a la escala de funcionalidad, la función física y la cognitiva presentaron mejora, y la función emocional empeoró después de tres meses de tratamiento. La escala de síntomas reveló empeoramiento, luego de tres meses del inicio de la quimioterapia, en lo que se refiere a los síntomas de fatiga, náuseas, disnea, pérdida de apetito y diarrea.

Conclusión: En este estudio, los dominios más afectados luego de tres meses de tratamiento de quimioterapia se relacionaron con funciones de la escala funcional y de los síntomas; por lo tanto, intervenciones multiprofesionales deben ser implementadas en esta población con el objetivo de controlar dichas variables.

Introduction

Cancer is a set of diseases characterized by an indiscriminate growth of cells, which can spread through the bloodstream or the lymphatic system, thus affecting other tissues and organs. These cells are aggressive and divide quickly to form a cell mass, called a tumor,^(1,2) being one of the leading causes of mortality from diseases worldwide.⁽³⁾

This increase is due, in part, to aging and population growth, as well as to changes in the distribution and prevalence of risk factors for cancer, especially those related to socioeconomic development. Consequently, there is a change in the main types of cancers identified in developing countries, with a fall in the types of cancer related to infections and an increase in those associated with better socioeconomic conditions and the set of lifestyle habits, such as the lack of physical activities, inadequate nutrition, among others.⁽⁴⁾ The latest global estimate points to 18 million new cancer cases and 9.6 million deaths in 2018.⁽⁴⁾

In Brazil, the estimate for the 2020-2022 triennium points out that there will be 625 thousand new cases of cancer (450 thousand, excluding cases of non-melanoma skin cancer). Non-melanoma skin cancer will figure prominently (177 thousand), followed by breast and prostate (66 thousand each), colon and rectum (41 thousand), lung (30 thousand) and stomach (21 thousand) cancers.⁽⁴⁾ The most common types of cancer in men, with the exception of non-melanoma skin cancer, will be prostate (29.2%), colon and rectum (9.1%), lung (7.9%), stomach (5.9 %) and oral cavity (5.0%); and, in women, breast (29.7%), colon and rectum

(9.2%), cervix (7.4%), lung (5.6%) and thyroid (5.4%) cancers will be among the most frequent.⁽⁴⁾

These statistics show that the country will continue with high numbers of female breast, prostate, colon and rectum and lung cancers, although it also has high rates for stomach cancers, calling attention to non-melanoma skin cancer incidence.

Choosing treatment method depends on the nature and extent of the disease. Surgery (resection), radiotherapy and chemotherapy are the most frequent strategies for cancer management.⁽²⁾ Chemotherapy eliminates cancer cells and also affects normal cells, being considered a therapy with high incidence of side effects.⁽⁵⁾

Treatment interferes with patients' physical conditions, causing worsening of physical symptoms such as insomnia, nausea, fatigue, appetite loss, and alopecia. Moreover, it interferes with the ability to perform activities of daily living (independence and autonomy), interpersonal relationships and the way patients analyze this situation and themselves, adding to the risk of emotional and psychological imbalance; there is a fear of living with the difficulties that disease and treatment cause and the very stigma of cancer diagnosis being associated with death. All of these possible changes can affect expectations for the future and, consequently, quality of life.⁽⁶⁾

Quality of life (QoL) is defined as "the individual's perception of his position in life, within the cultural system and values in which he lives and in relation to his goals, expectations, standards and concerns",⁽⁷⁾ i.e., QoL is related to satisfaction in family, loving, social and environmental life. The term health-related quality of life (HRQoL) is more widely used in the field of health. HRQoL is linked

to changes in perception, functional, emotional state and social factors influenced by health, diseases and treatments, i.e., it is related to health intervention and diseases.⁽⁸⁾

Assessing side effects of cancer treatment on the HRQoL of patients diagnosed with cancer can assist multidisciplinary team, especially nursing professionals, in planning interventions that minimize these possible side effects; therefore, considering the above, this study aimed to assess the HRQoL of patients with cancer before and three months after starting chemotherapy treatment.

Methods

This is a prospective, exploratory, quantitative cohort study conducted at the oncology service of a charitable hospital in the city of Três Lagoas, state of Mato Grosso do Sul. All patients who started chemotherapy treatment at the referred institution from June 2018 to June 2019 were invited to participate in the research. The convenience sample was composed of 79 participants with prescription for chemotherapy treatment and over 18 years old. Those with communication disabilities have been excluded.

The research site operates daily from 7 a.m. to 5 p.m., where procedures such as chemotherapy, immunotherapy, medical consultation, medication administration, dressings and probes are performed. This service is aimed at patients of the Unified Health System (SUS - *Sistema Único de Saúde*) with health insurance. It is an extremely important service in the macro-region, considering the agility with which initiation of treatments and interventions takes place and since other oncology reference centers are ostracized.

All patients who started chemotherapy treatment during the research period were recruited. After being selected, the eligible individuals were invited to participate in the research, and those who accepted were included in the study and signed the Informed Consent Form (ICF). Two researchers were trained to conduct the data collection interviews, which were carried out in a chemotherapy

room (in the armchair where patients would receive treatment). On the first day - before starting chemotherapy infusion (T1) - and three months after (T2), on both occasions, all interviews took place individually and using a screen to ensure the privacy of those involved.

Two instruments were used for data collection: sociodemographic and clinical characterization questionnaire and the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire - Core 30 (EORTC QLQ-C30, version 3), specific for patients with cancer, validated into Brazilian Portuguese. At first, both questionnaires were applied before starting chemotherapy (T1); in the second moment (T2), three months after T1, only the EORTC was applied, in addition to collecting sociodemographic information to which changes had occurred in the three-month period.⁽⁹⁻¹³⁾

The EORTC QLQ-C30 has 30 questions divided into three main scales: functional scale, which has five subscales that assess physical, cognitive, emotional, social and role functioning; symptom scale, which assesses issues related to pain, fatigue, nausea/vomiting, dyspnea, insomnia, appetite loss, constipation, diarrhea, and financial difficulties; and global health status/QoL scale. To calculate each scale's score, a linear transformation of the score (0 to 100) was carried out according to the EORTC QLQ-C30 recommendations. For functional and global health status/QoL scales, the higher the score, the better the functioning; the opposite occurs with the symptom scale, with the score closest to zero regarding absence of symptoms.⁽⁹⁾

The data were initially entered into a Microsoft Excel spreadsheet, and statistical analysis was performed using the SPSS 22.0 program. For descriptive statistical analysis, calculation of relative and absolute frequency was performed for categorical variables, and calculation of mean and standard deviation for quantitative variables.

Concerning analysis of the EORTC QLQ C30's reliability, the internal consistency of each scale of the instrument and of the global instrument was calculated by Cronbach's alpha. It was considered an adequate internal consistency when a Cronbach's

alpha > 0.70 was obtained. To analyze the impact of chemotherapy treatment on QoL, Student's t-test for paired samples was applied, comparing the means of each scale of the EORTC QLQ-C30 and its indicators. A p value <0.05 was considered to be statistically significant.

The study complied with CNS (*Conselho Nacional de Saúde* – National health Council) Resolution 466/12 and was approved by the Ethics Committee of *Universidade Federal do Mato Grosso do Sul*, under Opinion 2,621,175 and CAAE (*Certificado de Apresentação para Apreciação Ética* - Certificate of Presentation for Ethical Consideration) 87369118.5.0000.0021.

Results

The sample consisted of 79 participants. Most were women, aged over 60 years, with a partner, with an income of up to 4 minimum wages, with education up to complete or incomplete elementary education, Catholic and white, as shown in Table 1. With regard to life habits, most were smokers and ex-smokers, did not consume alcohol, did not practice physical activity, did not work or exercised remunerated activity during the research period, did not receive help to perform activities of daily living and did not use continuous medication.

The most prevalent types of cancer were bowel (28%), breast and gynecological (28%), head and neck (15%), gastrointestinal system (11%), lung (8%), and others (9%). The tumors described in the category “other” were lymphoma, bladder, kidney, and unknown. Most did not have a diagnosis of metastasis (77%), time of diagnosis was between zero and four months (71%), and most of them did not undergo nutritional (72%) and psychological (86%) follow-up, according to Table 2.

After assessing the EORTC QLQ-C30's internal consistency, a Cronbach's alpha of 0.86 was obtained. On the functional scale, Cronbach's alphas were 0.87 and 0.88 in the first and second moments; on the symptom scale, Cronbach's alphas were 0.83 and 0.79; and on the global health status/QoL scale, Cronbach's alphas were 0.87 and 0.88.

Table 1. Sociodemographic characteristics of participants under chemotherapy treatment

Characteristics	n(%)
Sex	
Female	48(61)
Male	31(39)
Age	
from 20 to 39 years	9(11)
40 to 49 years	11(14)
50 to 59 years	19(24)
≥ 60 years	40(51)
Income (MW)	
0 to 2	39(49)
3 to 4	32(41)
> 5	8(10)
Marital status	
With partner	48(61)
Without partner	31(39)
Education	
Illiterate	3(4)
Complete/incomplete elementary school	45(57)
Complete/incomplete high school	27(34)
Complete/incomplete higher education	4(5)
Religion	
Catholic	55(70)
Evangelical	20(25)
Others	4(5)
Race	
White	38(49)
Mixed-race	31(39)
Caucasian	1(1)
Black	9(11)
Smoking	
Smoker/ex-smoker	47(60)
Never smoked	32(40)
Ethics	
Consume alcohol	6(8)
Do not consume alcohol	73(92)
Physical activity practice	
Yes	33(42)
No	46(58)
Currently working	
Yes	24(30)
No	55(70)
Need help carrying out daily activities	
Yes	8(10)
No	71(90)
Medications	
No	31(40)
Up to two	22(27)
More than three	17(21)
Do not remember	9(12)

MW - minimum wage; R\$ 954.00 and 998.00 (reference values from 2018 and 2019, about 238-250 US dollars)

When comparing the scores of final functional and global health status/QoL scales before and three months after starting chemotherapy, it was found that there was no statistically significant difference;

Table 2. Clinical characteristics of patients under chemotherapy

Characteristics	n(%)
Type of neoplasm	
Bowel	22(28)
Breast and gynecological	22(28)
Head and neck	12(15)
Lung	6(8)
Gastrointestinal system	9(11)
Others	7(9)
Metastasis	
Yes	18(23)
No	61(77)
Diagnosis time (months)	
0 to 4	56(71)
5 to 11	17(21)
More than 12	6(8)
Nutritional monitoring	
Yes	22(28)
No	57(72)
Psychological monitoring	
Yes	11(14)
No	68(86)

however, regarding the symptom scale, there was a significant worsening of this indicator after three months of chemotherapy (p <0.001), according to Table 3.

Table 3. Mean score of the EORTC QLQ-C30 obtained in pre-treatment (T1) and three months after chemotherapy (T2)

Mean score of scales' dimensions	T1	T2	P value*
	Mean (SD)	Mean (SD)	
Final functional scale	35.44 (23.0)	35.67 (24.18)	0.87
Physical functioning	32.74 (28.4)	36.11 (28.59)	<0.01
Cognitive functioning	17.51 (26.8)	20.89 (28.67)	0.04
Emotional functioning	49.47 (33.8)	42.72 (33.87)	<0.01
Social functioning	26.16 (29.5)	32.28 (30.11)	0.06
Role functioning	41.35 (39.9)	38.61 (37.41)	0.47
Final symptom scale	26.68 (21.3)	34.53 (20.49)	<0.001
Pain	39.66 (40.5)	33.33 (38.3)	0.09
Fatigue	34.74 (34.6)	41.35 (29.9)	0.01
Nausea	9.92 (24.3)	34.60 (33.4)	<0.01
Dyspnea	9.70 (23.3)	17.30 (31.5)	0.04
Insomnia	41.35 (43.7)	40.93 (41.3)	0.94
Appetite loss	29.11 (38.9)	44.73 (39.5)	<0.01
Constipation	29.54 (43.6)	30.80 (39.5)	0.74
Diarrhea	6.75 (20.2)	13.50 (26.9)	0.05
Financial difficulties	27.00 (35.0)	41.77 (39.39)	<0.01
Final global health status/QoL	68.14 (27.63)	64.66 (23.87)	0.19

SD - standard deviation; QoL - quality of life; * Student's t-test for paired samples

Analysis of all items of each dimension of the functional scale showed improvement after three months of treatment in physical (p. <0.01) and cognitive (p. 0.04) functioning, although with worsening in terms of emotional functioning (p. <0.01). In

the final symptom scale, fatigue (p.0.01), nausea (p <0.01), dyspnea (p. 0.04), appetite loss (p. <0.01), diarrhea (p. 05) and financial difficulties (p. <0.01) symptoms worsened, as shown in Table 3.

Discussion

The sample's sociodemographic profile revealed characteristics similar to those of other studies.^(14,15) There was a prevalence of females, with a mean age of 57 years old and people who lived with a partner; these data converge according to information from the Brazilian National Cancer Institute (INCA) and showed a higher incidence of cancer in people over 40 years old.⁽⁴⁾

Although participants do not represent the Brazilian population because it was a sample from a medium-sized hospital, the clinical characteristics identified in this study were similar to those found in another investigation with older people in Brazil with cancer, in which the majority were women and with an income of up to two minimum wages.⁽⁹⁾ In this study, the greatest number of patients were not working at the time of data collection due to retirement or on leave due to medical diagnosis and treatment, reinforcing the concept that cancer treatment can lead to early time off work, contributing to the high percentage of sick leave.⁽⁸⁾

As for education and income, low educational and socioeconomic levels figured prominently, similar to a study carried out in the city of Recife, state of Pernambuco,⁽¹⁶⁾ which may justify the identified data of worsening pertinent to financial difficulties three months after starting chemotherapy treatment, because the symptom scale worsening can compromise the ability to perform paid work activities.^(15,16)

Most participants were smokers and ex-smokers (60%), overlapping patients who did not smoke. According to INCA, smoking is a risk factor for several cancers, in addition to cardiovascular and respiratory diseases.⁽¹⁷⁾

Concerning lifestyle characteristics, most (58%) did not practice physical activity, a finding that was similar to that of a survey in which women did

not practice physical activity in more than 56.5% of cases.⁽¹⁵⁾ This fact is important to note, since the International Agency for Research on Cancer (IARC) considers a sedentary lifestyle to be a risk factor for the development of breast cancer.⁽¹⁵⁾ The habit of performing physical activity, in addition to being a protective factor, promotes physical and emotional well-being for patients during treatment.⁽¹⁶⁾

Bowel and breast/gynecological cancer had higher incidence in this study, and, when compared with a study in Pernambuco, breast (32.3%), lung (22.6%) and prostate (16.1%) cancers had higher incidence.⁽⁸⁾ Data from INCA estimate also corroborate the study on screen, since the profile of the most commonly found cancers in Brazil, in the 2018-2019 biennium, were prostate, lung, female breast and colon and rectum.⁽⁴⁾ With the exception of non-melanoma skin cancer, the most common types of cancer in men were prostate (31.7%), lung (8.7%), intestine (8.1%), stomach (6.3%), and oral cavity (5.2%); and, in women, breast (29.5%), bowel (9.4%), cervix (8.1%), lung (6.2%) and thyroid (4.0%) cancers.⁽⁴⁾ Prostate cancer was not mentioned in the results of the study, because, in the outpatient clinic where the research was developed, almost all patients underwent only surgical treatment and immunotherapy; and the few more advanced cases were undergoing chemotherapy. The high prevalence of breast and bowel cancers was justified by the greater number of women present in this study.

There were no significant changes on the functional scale, comparing the two data collection moments, indicating that the functioning domain was not affected by chemotherapy treatment, but remained with low mean, indicating losses even before starting treatment.⁽¹⁷⁾ A study with older persons reports results that worsened in the physical performance domain, which can be explained by the number of elderly people and, therefore, it was previously altered due to other comorbidities and physical condition, which is in accordance with this study, in which there was a higher prevalence of older persons.⁽⁸⁾

The findings of this study showed an improvement in physical and cognitive functioning three

months after starting chemotherapy treatment. These data differed from the results identified in another study,⁽¹⁸⁾ in which it is exposed that there was a worsening in physical functioning due to side effects of chemotherapy treatment, thus changing the QoL of patients.

A justification concerning the physical improvement reported by the study patients would be that what happened was related to cognitive functioning improvement. Patients who show improvement in cognitive functioning and understanding of their problem may feel more confident to perform their daily activities, thus having a perception of physical improvement. Another point that could justify the reported improvement would be that 49% of patients in this study were under 60 years old, which would be a protective factor for physical disposition, despite the diagnosis.⁽¹⁴⁾

Concerning the cognitive functioning improvement reported by patients, it could be justified because, when starting chemotherapy, they were in greater contact with the health professionals responsible for their treatment; thus, they received more information and clarification relevant to their doubts regarding the disease and treatment. It is worth mentioning the importance of nursing staff is, which, due to its proximity to the patient during treatment, can establish bonds of trust and facilitate clarifications.^(15,16)

Emotional functioning was assessed using questions that covered anxiety, worry, irritation and depression, one of the areas that showed worsening in the second assessment. This finding is also evidenced in a survey conducted in Recife, with women with breast cancer, in which this domain reports more changes.⁽¹⁶⁾ Since there are several factors involved, the relationship between breast cancer and depression is complex and is often not identified and diagnosed, and emotional changes can remain throughout treatment and even after it ends.^(18,19)

In this study, it was noticed that most participants did not undergo psychological counseling before and after the diagnosis of cancer. The risk of serious emotional changes may have caused a high loss in the HRQoL of these patients and in continuity of treatment. Nurses are the ones in charge and

act as interlocutors of health teams; they can then lead different forms of intervention in the face of situations that may harm patients' lives, in addition to planning actions that result in greater safety and quality of care.⁽²⁰⁾

In a study⁽²¹⁾, a series of alterations pertaining to the emotional field in patients diagnosed with cancer are discriminated, such as the desire to improve self-concept, despair, risk of compromising human will, personal identity disorder, feeling of impotence, risk loneliness, low situational self-esteem, body image disorder, interrupted family processes, desire to improve the family process, inefficient denial, stress, sadness, social isolation; therefore, it is important that nurses are attentive and identify these possible changes so that they can implement nursing actions independently or in conjunction with other health professionals, such as helping to improve self-perception, promoting hope and improving coping, strengthening self-esteem, improved socialization, increased security, emotional support and active listening, in addition to including family members to help and support the treatment process, positively influencing the stress and difficulties.⁽²¹⁾

Fatigue, dyspnea, nausea, appetite loss, diarrhea and financial difficulties were the symptoms that worsened after three months of chemotherapy treatment. According to a study carried out with patients with breast cancer, these changes are revealed after the second chemotherapy session and also when the diagnosis is later; this may be related to more aggressive treatment and a difficulty in acquiring medications to control these symptoms.⁽¹⁴⁾ Fatigue prevalence was high in this study, a result that is similar to that observed in investigations carried out in other countries.^(22,23)

Insomnia, fatigue, dyspnea and appetite loss and pain are the most prevalent symptoms in a study conducted in 2016 with 162 patients with cancer;⁽²⁴⁾ thus, it can be inferred that the severity of symptoms can affect both physical functioning and emotional functioning, as evidenced in the present study.

The relationship between fatigue and cancer is common and, despite having multiple factors, it is reported as an intense state of exhaustion, with

duration and intensity greater than the common fatigue. Fatigue can affect the functional domains, reduce personal satisfaction and QoL,⁽²⁵⁾ interfere with patients' daily activities and treatment itself, because when very intense, there may be a need to interrupt treatment or reduce the dose of chemotherapy.⁽¹¹⁾

Appetite loss can occur both because of the physical aspects related to symptom appearance - changes in taste, nausea, mucositis and enteritis - as well as with regard to emotional aspects - changes in mood in patients with cancer directly associated with the appearance other symptoms, such as weight loss, constipation, diarrhea, fatigue and worsening breathing pattern, in addition to worsening QoL and mortality. Therefore, multidisciplinary interventions should be performed immediately for these patients, starting with food intake analysis to identify situations of nutritional risk and early incorporation of food supplements.^(26,27)

In the present study, there was a reduction in insomnia and pain levels after three months of treatment, although without statistical significance. A hypothesis for improvement of these symptoms may have been the action of chemotherapy in a positive way in diseases prognosis or also by the action of medications used during treatment to control symptoms. Both are common symptoms in patients with cancer, and pain can interfere with quality of sleep, according to a study that presents data different from those detected in this one, as it reports that insomnia and pain increase during chemotherapy and impact on QoL.⁽¹⁰⁾ Other studies confirm the association between cancer pain and impaired QoL.^(28,29)

It was observed that the final global health status/QoL scores assessed decreased after three months of treatment compared to T1 and T2, but without statistical significance. Global health status/QoL was assessed through a self-assessment of patients. Patients rated it according to their perception of their overall health quality. Most of participants, although it was a disease situation, did not consider global health status/QoL to be bad. There is no exact way to quantify it, as it is subjective and personal; therefore, what a great quality life is

for one person may not be for another. HRQoL is characterized as unsatisfactory in a study;⁽⁵⁾ however, in another, there is no change between before and after, except for patients with prostate cancer.⁽⁸⁾ HRQoL is likewise considered great by participants of another investigation, whose results also point to changes in other domains.^(15,16,30)

This study made important contributions to nursing possible because routine follow-up visits to this population would be beneficial in the early detection of changes in functioning and symptoms, in addition to providing professionals with data to use and implement nursing classifications. Knowing HRQoL, in this group of patients, allows nurses to plan care performance in chemotherapy services in order to individualize and improve quality of care.

The fact that the sample was of convenience and the data were collected in a single scenario, making it impossible to generalize results, was one of the limitations of the study.

Conclusion

The data identified in this study revealed that the most affected domains, after three months of chemotherapy treatment, were related to the emotional functioning of the functional scale, and fatigue, nausea, appetite loss, dyspnea, diarrhea and financial difficulties of the symptom scale; improvement was identified in physical functioning and cognitive functioning of the functional scale. Bearing that in mind, it was possible to infer that knowing the action of side effects of chemotherapy treatment on HRQoL provides assistance to nursing staff in care and rehabilitation planning; thus, the aim is to identify and carry out interventions to reduce treatment losses as well as to make it possible to develop strategies to ensure that these patients have a quality life throughout this period.

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Collaborations

Silveira FM, Wysocki AD, Mendez RDR, Pena SB, Santos EM, Malaguti-Toffano S, Santos VB and Santos MA declare they have contributed with study design, data collection and interpretation, relevant critical review of intellectual content and approval of the final version to be published.

References

1. Instituto Nacional de Câncer (INCA). O que é o câncer? [Internet]. Rio de Janeiro: INCA; 2019. [citado 2019 Ago 8]. Disponível em: <https://www.inca.gov.br/o-que-e-cancer>
2. Floriano DF, Ribeiro PF, Maragno AC, Rossi K, Simões PW. Oral complications in patients treated with radiotherapy or chemotherapy in a hospital in Santa Catarina. *Rev Odontol Univ Cid São Paulo*. 2017;29(3):230–6.
3. Panis C, Kawasaki AC, Pascotto CR, Justina EY, Vicentini GE, Lucio LC, Prates RT. Critical review of cancer mortality using hospital records and potential years of life lost. *einstein* (São Paulo). 2018;16(1):eA04018.
4. Instituto Nacional de Câncer (INCA). Estimativa 2020: incidência de câncer no Brasil [Internet]. Rio de Janeiro: INCA; 2020 [citado 2020 Abr 24]. Disponível em: <http://www.inca.gov.br/estimativa/2020/estimativa-2020.pdf>
5. Gomes RA, Coelho AC, Moura DC, Cruz JSC, Santos KB. Evaluation of the quality of life of patients with onco-haematological disease in chemotherapy. *Rev enferm UFPE*. 2018 [;12(5):1200-5.
6. Santos AL, Franco HH, Vasconcelos FC. [Association between nutritional status and psychological changes in patients with gastrointestinal cancer]. *Braspen J*. 2017;32(4):362–8. Portuguese.
7. Correia RA, Bonfim CV, Ferreira DK, Furtado BM, Costa HV, Feitosa KM, et al. Quality of life after treatment for cervical cancer. *Esc Anna Nery*. 2018;22(4):e20180130.
8. Ferreira ML, Souza AI, Ferreira LO, Moura JF, Junior JI. Qualidade de vida relacionada à saúde de idosos em tratamento quimioterápico. *Rev Bras Geriatr Gerontol*. 2015;18(1):165–77.
9. Paiva CE, Carneseca EC, Barroso EM, de Camargos MG, Alfano AC, Rugno FC, et al. Further evaluation of the EORTC QLQ-C30 psychometric properties in a large Brazilian cancer patient cohort as a function of their educational status. *Support Care Cancer*. 2014;22(8):2151–60.

10. Amorim JR, Silva IA, Shimizu IS. Avaliação da qualidade de sono em pacientes com câncer de mama em quimioterapia. *Rev Bras Mastologia*. 2017;27(1):3–7.
11. Avelar JM, Nicolussi AC, Toneti BF, Sonobe HM, Sawada NO. Fatigue in patients with head and neck cancer undergoing radiation therapy: a prospective study. *Rev Lat Am Enfermagem*. 2019;27:e3168.
12. Aaronson NK, Ahmedzai S, Bergman B, Bullinger M, Cull A, Duez NJ, 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.
13. Pais-Ribeiro J, Pinto C, Santos C. Validation study of the portuguese version of the QLC-C30-V.3. *Psicol Saude Doencas*. 2008;9(1):89–102.
14. Garcia SN, Félix JV, Montovani MF, Maftum MA, Kalinke LP. Quality of life of women with breast cancer receiving chemotherapeutic treatment. *Rev Baiana Enferm*. 2017;31(2):e17489.
15. Andrade V, Sawada NO, Barichello E. Quality of life in hematologic oncology patients undergoing chemotherapy. *Rev Esc Enferm USP*. 2013 Apr;47(2):355–61.
16. Coelho RC, Panobianco MS, Guimarães PR, Guimarães PR, Maftum MA, Santos PN, Kalinke LP. Adjuvant and neo adjuvant chemotherapy and the implications in the quality of life women with breast cancer. *Rev Enferm UFPE Online*. 2017;11(Supl 11):4732-40.
17. Instituto Nacional de Câncer (INCA). Prevenção e fatores de risco [Internet]. Rio de Janeiro: INCA; 2018. [citado 2019 Ago 8]. Disponível em: <https://www.inca.gov.br/causas-e-prevencao/prevencao-e-fatores-de-risco>
18. Villar RR, Fernández SP, Garea CC, Pillado MT, Barreiro VB, Martín CG. Quality of life and anxiety in women with breast cancer before and after treatment. *Rev Lat Am Enfermagem*. 2017;25(0):e2958.
19. Mansano-Schlosser TC, Ceolim MF. Longitudinal variations of sleep quality in women with breast cancer. *Acta Paul Enferm*. 2016;29(5):595–602.
20. Spotten LE, Corish CA, Lorton CM, Ui Dhuibhir PM, O'Donoghue NC, O'Connor B, et al. Subjective and objective taste and smell changes in cancer. *Ann Oncol*. 2017;28(5):969–84.
21. Ribeiro JP, Cardoso LS, Pereira CM, Silva BT, Bubolz BK, Castro CK. Nursing care in oncology hospitalized patients: diagnosis and interventions related to psychosocial and psychospiritual needs. *Rev Fund Care Online*. 2016;8(4):5136–42.
22. Jean-Pierre P, Morrow GR, Roscoe JA, Heckler C, Mohile S, Janelins M, et al. A phase 3 randomized, placebo-controlled, double-blind, clinical trial of the effect of modafinil on cancer-related fatigue among 631 patients receiving chemotherapy: a University of Rochester Cancer Center Community Clinical Oncology Program Research base study. *Cancer*. 2010 Jul;116(14):3513–20.
23. Hofman M, Ryan JL, Figueroa-Moseley CD, Jean-Pierre P, Morrow GR. Cancer-related fatigue: the scale of the problem. *Oncologist*. 2007;12(S1 Suppl 1):4–10.
24. Salvetti MG, Machado CS, Donato SC, Silva AM. Prevalence of symptoms and quality of life of cancer patients. *Rev Bras Enferm*. 2020;73(2):e20180287.
25. Borges JA, Quintão MM, Chermont SS, Mendonça Filho HT, Mesquita ET. Fatigue: A Complex Symptom and its Impact on Cancer and Heart Failure. *Int J Cardiovasc Sci*. 2018;31(4):433–42.
26. Mattox TW. Cancer Cachexia: cause, diagnosis, and treatment. *Nutr Clin Pract*. 2017 Oct;32(5):599–606.
27. Arends J, Bachmann P, Baracos V, Barthelemy N, Bertz H, Bozzetti F, et al. ESPEN guidelines on nutrition in cancer patients. *Clin Nutr*. 2017;36(1):11–48.
28. Cardoso G, Graca J, Klut C, Trancas B, Papoila A. Depression and anxiety symptoms following cancer diagnosis: a cross-sectional study. *Psychol Health Med*. 2016;21(5):562-70.
29. Barrett M, Chu A, Chen J, Lam KY, Portenoy R, Dhingra L. Quality of life in community-dwelling chinese american patients with cancer pain. *J Immigr Minor Health*. 2017;19(6):1442-8.
30. Avelino CU, Cardoso RM, Aguiar SS, Silva MJ. Assessment of quality of life in patients with advanced non-small cell lung carcinoma treated with a combination of carboplatin and paclitaxel. *J Bras Pneumol*. 2015;41(2):133–42.