

# QUALITY OF LIFE OF PATIENTS WITH LIVER METASTASIS DUE TO COLORECTAL CANCER

## QUALIDADE DE VIDA DE PACIENTES COM METÁSTASE HEPÁTICA EM DECORRÊNCIA DE CÂNCER COLORRETAL

## CALIDAD DE VIDA DE LOS PACIENTES CON METÁSTASIS HEPÁTICA POR CÁNCER COLORRECTAL

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**Objective:** to evaluate and correlate the quality of life domains of patients with liver metastasis of colorectal cancer undergoing chemotherapy. **Method:** cross-sectional, observational study with 106 patients selected in three hospitals in southern Brazil. Data were collected using the Quality of Life Questionnaire Core 30 and Quality of Life Questionnaire Colorectal Liver Metastases, analyzed descriptively and by Spearman's correlation test. **Results:** sexual life (45.08%), emotional function (43.08%) and fatigue (40.15%) had the worst scores with the Quality of Life Questionnaire Colorectal Liver Metastases. All correlations between the domains are significant, demonstrating that a domain with a low score interferes in all others. **Conclusion:** patients with liver metastasis from colorectal cancer undergoing chemotherapy showed changes in quality of life domains.

**Descriptors:** Quality of Life. Colorectal Neoplasms. Neoplasm Metastasis. Oncology Nursing.

*Objetivo: avaliar e correlacionar os domínios da qualidade de vida de pacientes com metástase hepática de câncer colorretal em tratamento quimioterápico. Método: estudo transversal, observacional, com 106 pacientes selecionados em três hospitais do Sul do Brasil. Os dados foram coletados com o Quality of Life Questionnaire Core 30 e Quality of Life Questionnaire Colorectal Liver Metastases, analisados descritivamente e pelo teste de correlação de Spearman. Resultados: a vida sexual (45,08%), função emocional (43,08%) e fadiga (40,15%) tiveram os piores escores com o Quality of Life Questionnaire Colorectal Liver Metastases. Todas as correlações entre os domínios são significativas, demonstrando que um domínio com escore baixo interfere em todos os demais. Conclusão: os pacientes com metástase hepática de câncer colorretal em tratamento quimioterápico apresentaram alteração nos domínios de qualidade de vida.*

*Descritores: Qualidade de Vida. Câncer Colorretal. Metástase. Enfermagem Oncológica.*

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*Objetivo: evaluar y correlacionar los dominios de calidad de vida de pacientes con metástasis hepática de cáncer colorrectal sometidos a quimioterapia. Método: estudio observacional transversal con 106 pacientes seleccionados en tres hospitales del sur de Brasil. Los datos fueron recolectados mediante el Quality of Life Questionnaire Core 30 y Quality of Life Questionnaire Colorectal Liver Metastases, analizados descriptivamente y mediante la prueba de correlación de Spearman. Resultados: la vida sexual (45,08%), la función emocional (43,08%) y la fatiga (40,15%) tuvieron las peores puntuaciones con el Quality of Life Questionnaire Colorectal Liver Metastases. Todas las correlaciones entre los dominios son significativas, demostrando que un dominio con una puntuación baja interfiere en todos los demás. Conclusión: los pacientes con metástasis hepática por cáncer colorrectal sometidos a quimioterapia mostraron cambios en los dominios de calidad de vida.*

*Descriptores: Calidad de Vida. Neoplasias Colorrectales. Metástasis de la Neoplasia. Enfermería Oncológica.*

## Introduction

Colorectal cancer (CRC) is among those that most affect the world population. It is considered the third most frequent in the world. In 2018, the world estimate was more than 1.8 million new cases and 861,663 deaths. In Brazil, it is the second most frequent, with an estimated 40,990 new cases in the biennium 2020 and 2021<sup>(1-2)</sup>.

The treatment of choice for the CRC considers the staging, extension of the disease and general health of the patient. The earlier the diagnosis and initiation of treatment, the greater the chances of survival. However, patients with metastatic CRC have a high mortality rate, with a five-year survival rate of 12%<sup>(3)</sup>. Liver metastasis is the most frequent and can reach approximately 19% to 31% of patients with this type of cancer<sup>(4)</sup>.

Among the available therapeutic options, tumor resection is the one that provides the highest chances of cure. However, patients with advanced disease may have liver metastasis and be unable to perform the procedure, making chemotherapy the treatment of choice. This, in turn, because it is a systemic therapy, can cause side effects that impact the lives of patients and family members, enhancing the emotional stress of the diagnosis and the physical difficulties resulting from therapy<sup>(5)</sup>.

Physical problems, such as changes in urinary, intestinal and sexual performance functions, are conditions resulting from CRC, which can cause social isolation and psychological problems, making it difficult to live in society<sup>(6)</sup>. These conditions directly impact on health-related quality of life (HRQOL), which was defined

as perceived health status, that is, how much the disease or chronic state is perceived by the individual<sup>(7)</sup>. Thus, identifying the needs of patients affected by CRC, through the measurement of HRQoL, is a prerequisite for offering care focused on their real needs.

Furthermore, measuring the HRQoL of patients with liver metastasis of CRC helps in the evaluation of therapy, especially in the impact of treatment in relation to the disease and people's lives. To this end, in 2003, the European Organization for Research and Treatment of Cancer (EORTC) created the Quality of Life Questionnaire Colorectal Liver Metastases (QLQ-LMC21)<sup>(8)</sup> that measures the quality of life (QOL) of patients with CRC with liver metastasis. In Brazil, it was translated, adapted to culture and validated<sup>(9)</sup>.

Although QLQ-LMC21 validation in Brazil has been conducted, research on the evaluation of HRQoL of patients with liver metastasis from colorectal cancer is scarce. Therefore, evaluating HRQoL in patients with liver metastasis and identifying altered domains becomes of fundamental importance, so that health professionals can define better managements for treatment, since liver metastasis is one of the most common and directly affects the lives of patients with CRC. In addition, there is a scarcity of evidence in the literature specifically for this group of patients.

Therefore, the aim of this study was to evaluate and correlate the domains of health-related quality of life of patients with liver

metastasis from colorectal cancer undergoing chemotherapy.

## Method

Cross-sectional study conducted with 106 patients with liver metastasis from colorectal cancer undergoing chemotherapy, selected in a non-probabilistic way. Data were collected in three centers of care for cancer patients in the state of Paraná, Brazil, two located in the city of Curitiba and one in Foz do Iguaçu.

Data were collected from February 2018 to August 2019. Patients with liver metastasis from colorectal cancer undergoing chemotherapy treatment and aged 18 years or older were included in the study. Patients unable to answer the questionnaire were excluded due to limitations in mental, cognitive and/or communicating conditions. The patients were instructed to fill out the instruments. The approach occurred in a private environment while undergoing chemotherapy. The response time varied between 15 and 40 minutes.

Three instruments were applied to collect data: sociodemographic and clinical, with questions about gender, age, marital status, primary tumor site, presence or absence of stoma, chemotherapy protocol, among others; Quality of Life Questionnaire Core 30 (EORTC QLQ-C30), a questionnaire consisting of a global health scale, five items on the functional scale, three items of the symptom scale and six individual items of symptoms; Quality of Life Questionnaire Colorectal Liver Metastases (EORTC QLQ-LMC21), a module of the QLQ-C30: 21 items of the instrument are grouped into four subscales (fatigue, nutritional problems, pain and emotional problems) and nine individual items (related to problems with taste, tingling in the hands, sore mouth, dry mouth, jaundice and weight loss)<sup>(8,10)</sup>.

The QLQ-C30 and QLQ-LMC21 questionnaires are structured to be self-administered, with four-point Likert scale responses, corresponding to (1) “no”, (2) “little”, (3) “moderately”, (4) “very”. For the qlq-C30 global health scale,

the answers vary on a Likert scale from 1 to 7, 1 corresponding to “bad” and 7 to “optimal”<sup>(8,10)</sup>.

All data were analyzed with the help of the Software Statistical Package for Social Sciences (SPSS), version 20.0. The characterization of the participants’ data, according to the sociodemographic and clinical variables, was analyzed by descriptive statistics and presented by means and frequencies. The descriptive analysis values of the QLQ-C30 and QLQ-LMC21 scores were converted to a scale from 0 to 100, according to the orientation for assessing the QOL proposed by the EORTC manual for their questionnaires<sup>(11)</sup>, to facilitate the analysis of QOL in their different scales, and presented in average, minimum, maximum and standard deviation. It is noteworthy that scores closer to 100 refer to a better HRQoL, except for the symptom scale; the lower the score, the lower its impact on HRQoL.

The correlations were evaluated between the different domains of the QLQ-LMC21, and the total score of each subscale was compared with the other items that measure distinct dimensions of the instrument. For this analysis, Spearman’s correlation test was performed, with p-value results below 0.05, considered significant.

This study was approved by the Research Ethics Committee with Human Beings of the *Hospital de Clínicas* of the *Universidade Federal do Paraná* (Opinion n. 2,137,221), *Hospital Ministro Costa Cavalcanti* (Opinion n. 2.592.656) and *Hospital Erasto Gaertner* (Opinion n. 2.822.368).

This article was extracted from the thesis “Translation, cross-cultural adaptation and validation of the EORTC QLQ-LMC21 questionnaire for the Brazilian Portuguese Version”, 2020<sup>(9)</sup>.

## Results

Of the 114 patients with liver metastasis from colorectal cancer that met the inclusion criteria, 8 refused to participate, totaling a sample of 106 patients. Regarding sociodemographic data, 59.4% (n=63) are male. The age of the

participants ranged from 32 to 86 years, with a mean of 58.2 years (SD=12.40 years). Regarding marital status and number of children, 60.4% (n=64) are married and 55.6% (n=59) have 2 to 3 children. Regarding occupation, 35.8% (n=38) reported receiving government benefits due to impossibility of working, and 28.3% (n=30) were receiving retirees for time of service or due to age.

Regarding the clinical data of the sample, 17% (n=18) reported having systemic arterial hypertension (SAH) as comorbidity, 14.1% (n=15) diabetes and 60.4% (n=64) reported not having other health problems linked to cancer. Regarding the use of medication, 18% (n=19) of the patients

stated that they made permanent use for pain control. When life habits were analyzed, 95.3% (n=101) reported not being smokers and alcohol consumers, 45.3% (n=48) reported consuming red meat at least three times a week and 67% (n=71) did not practice physical activity regularly.

It was identified that 42.4% (n=45) of the patients had ostomy. The most frequent chemotherapy regimen was the combination of 5-Fluorouracil® and Leucovorin® with Oxaliplatin® (FOLFOX) and Irinotecan® (FOLFIRI), 51.9% (n=55) and 25.5% (n=27), respectively. The colon region was responsible for 38.7% (n=41) of primary tumors and the rectum 31.1% (n=33) (Table 1).

**Table 1** – Clinical sociodemographic characterization and life habits of study participants. Curitiba, Paraná, Brazil – 2019-2020. (N=106)

<b>Variables</b>	<b>n</b>	<b>%</b>
(continued)		
<b>Sex</b>		
Male	63	59.43
Female	43	40.57
<b>Age</b>		
31 - 39 years	7	6.60
40 - 49 years	17	16.04
50 - 59 years	35	33.02
60 - 69 years	24	22.64
Over 70 years	23	21.70
<b>Marital Status</b>		
Consensual Union	8	7.55
Married	64	60.38
Widowed	12	11.32
Separated	5	6.60
Single	15	14.15
<b>N. of children</b>		
None	7	6.60
1 child	15	14.15
2 - 3 children	59	55.66
≥ 4 children	25	23.58
<b>Occupation</b>		
Working	29	27.36
Retired	30	28.30
Health aid	38	35.85
Housewife	7	6.60
Unemployed	2	1.89
<b>Comorbidity</b>		
Systemic arterial hypertension	18	16.98
Diabetes	15	14.15
High blood pressure and diabetes	9	8.49
None	64	60.38

**Table 1** – Clinical sociodemographic characterization and life habits of study participants. Curitiba, Paraná, Brazil – 2019-2020. (N=106)

Variables	n	(conclusion)
		%
<b>Drugs</b>		
Analgesic	19	17.92
Control of gastrointestinal symptoms	7	6.60
Antidepressants	13	12.26
Previous illnesses	35	33.02
None	49	46.23
<b>Smoking</b>		
Yes	5	4.72
No	101	95.28
<b>Alcohol consumption</b>		
Yes	-	-
No	106	100
<b>Regular physical activity</b>		
Yes	35	33.02
No	71	66.98
<b>Presence of stoma</b>		
Yes	45	42.45
No	61	57.55
<b>Chemotherapy regimen</b>		
5-Fluorouracil® and Leucovorin® with Oxaliplatin® (FOLFOX)	55	51.89
5-Fluorouracil and Leucovorin® with Irinotecan® (FOLFIRI)	27	25.47
Oxaliplatin®, Leucovorin® and 5-Fluorouracil (bolus) (FLOX)	2	1.89
Irinotecan	3	2.83
Oxaliplatin + Capecitabine (Xeloda) (XELOX)	7	6.60
5-fluorouracil® and leucovorin® (5FU+LV)	7	6.60
Cisplatin® and 5-fluorouracil® (CDDP + 5FU)	1	0.94
Carboplatin® and paclitaxel® (Carbo-taxol)	1	0.94
<b>Primary location of the tumor</b>		
Colon	57	53.77
Rectum	33	31.13
Rectosigmoid	13	12.26
Absent data	3	2.83
<b>Total</b>	<b>106</b>	<b>100</b>

Source: Created by the authors.

Note: Conventional sign used:

- Numerical data equal to zero not resulting from rounding.

Regarding the mean QLQ-C30 (Table 2), it was possible to observe that the scores of the items physical performance and cognitive performance were better in relation to the performance of social and emotional function,

the latter being the most affected domain. In the symptom scale, the most affected domains were in relation to financial issues, followed by insomnia, fatigue and pain. The least affected symptom was dyspnea.

**Table 2** – Descriptive measures of the Quality of Life Questionnaire Core domains 30. Curitiba, Paraná, Brazil – 2019-2020. (N=106)

<b>Quality of Life Questionnaire Core 30</b>	<b>Mean (Standard Deviation)</b>	<b>Minimum</b>	<b>Maximum</b>
<b>Functional scale</b>			
Physical performance	81.07 (18.95)	26.67	100
Function performance	75.47 (31.47)	0	100
Emotional performance	74.45 (26.98)	0	100
Cognitive performance	83.49 (24.93)	0	100
Social performance	77.36 (28.10)	0	100
<b>Scale of symptoms</b>			
Fatigue	24.11 (25.03)	0	100
Nausea and vomiting	8.33 (16.63)	0	100
Pain	22.96 (29.77)	0	100
Dyspnea	5.66 (16.89)	0	100
Insomnia	25.16 (38.71)	0	100
Loss of appetite	19.81 (34.97)	0	100
Cold	17.30 (32.28)	0	100
Diarrhea	15.72 (30.59)	0	100
Financial difficulty	33.65 (38.63)	0	100
<b>Global Quality of Life</b>	<b>75.08 (19.33)</b>	<b>25</b>	<b>100</b>

Source: Created by the authors.

When analyzing the data obtained by the QLQ-LMC21 (Table 3), it was possible to observe that the most affected domains were

emotional problems and fatigue. Regarding the individual items, the most affected were sexual life, peripheral neuropathy and dry mouth.

**Table 3** – Descriptive measures of the domains of the Quality of Life Questionnaire Colorectal Metastases Liver 21. Curitiba, Paraná, Brazil – 2019-2020. (N=106)

<b>Colorectal Metastases Liver 21</b>	<b>Mean (Standard Deviation)</b>	<b>n</b>
<b>Scales</b>		
Nutritional problems	18.24 (25.57)	106
Fatigue	40.15 (27.50)	106
Pain	18.66 (22.57)	106
Emotional problems	43.08 (26.36)	106
<b>Individual items</b>		
Weight loss	23.27 (37.42)	106
Taste	29.25 (38.96)	106
Dry mouth	36.48 (38.63)	106
Wounded mouth	13.21 (28.98)	106
Peripheral neuropathy	37.74 (38.23)	106
Jaundice	6.92 (21.44)	106
Contact with friends	13.84 (29.41)	106
Talk about feelings	10.69 (27.81)	106
Sexual life	45.08 (45.29)	105*

Source: Created by the authors.

Note: \*One absent datum (question not answered by a patient).

When the correspondence between the variables that make up the LQ-LMC was verified, it was possible to observe that the scales correlate positively with the individual items of the instruments, which are considered signs and symptoms of the disease or treatment. Thus, it is

possible to affirm that patients with low scores in individual items, such as weight loss (23.37) or peripheral neuropathy (37.74), among others, presented significant interference in the other items of the functional scales (Table 4).

**Table 4** – Statistically significant correlations of the total score of each subscale with items from different subscales belonging to the Quality of Live Questionnaire Colorectal Metastases Liver 21. Curitiba, Paraná, Brazil – 2019-2020. (N=106)

(continued)				
<b>Variables</b>	<b>Item</b>	<b>n</b>	<b>Spearman</b>	<b>p</b>
<b>Fatigue subscale total score</b>				
Nutritional problems	31	106	0.312	0.001
Taste	34	106	0.259	0.007
Sore tongue/mouth	36	106	0.207	0.033
Pain	40	106	0.230	0.018
Jaundice	41	106	0.214	0.027
Pain	42	106	0.300	0.002
Social Funtioning	46	106	0.234	0.016
Emotional Funtioning	47	106	0.215	0.027
Emotional Funtioning	48	106	0.364	0.001
Emotional Funtioning	49	106	0.323	0.001
Emotional Funtioning	50	106	0.327	0.001
<b>Pain subscale total score</b>				
Nutritional problems	31	106	0.326	0.001
Nutritional problems	32	106	0.444	0.001
Weight loss	33	106	0.248	0.010
Fatigue	43	106	0.250	0.010
Fatigue	44	106	0.202	0.038
Emotional Funtioning	47	106	0.249	0.010
Emotional Funtioning	48	106	0.266	0.006
Emotional Funtioning	49	106	0.289	0.003
Emotional Funtioning	50	106	0.239	0.014
Sexual Life	51	105	0.234	0.016
<b>Subscale total score Nutritional problems</b>				
Tasete	34	106	0.239	0.013
Sry mouth	35	106	0.256	0.008
Fatigue	37	106	0.261	0.007
Pain	39	106	0.312	0.001
Pain	40	106	0.363	0.001
Pain	42	106	0.421	0.001
Fatigue	44	106	0.234	0.016
Emotional Problems	47	106	0.225	0.021
Emotional Problems	48	106	0.196	0.045
Emotional Problems	49	106	0.204	0.036

**Table 4** – Statistically significant correlations of the total score of each subscale with items from different subscales belonging to the Quality of Live Questionnaire Colorectal Metastases Liver 21. Curitiba, Paraná, Brazil – 2019-2020. (N=106)

Variables	Item	n	Spearman	p
(conclusion)				
<b>Total score of the Emotional problems subscale</b>				
Nutritional Problems	31	106	0.192	0.049
Nutritional Problems	32	106	0.292	0.002
Weight Loss	33	106	0.389	0.001
Dry Mouth	35	106	0.238	0.014
Fatigue	37	106	0.467	0.001
Pain	39	106	0.225	0.020
Pain	40	106	0.195	0.045
Pain	42	106	0.385	0.001
Fatigue	43	106	0.218	0.025
Fatigue	44	106	0.327	0.001
Emotional Funtioning	45	106	0.385	0.001
Social Funtioning	46	106	0.210	0.030
Sexual Life	51	105	0.199	0.042

Source: Created by the authors.

Notes: Significant correlations between the total score of the Fatigue subscale and items 31, 34, 36, 40, 41, 42, 46, 47, 48, 49 and 50 (belonging to different subscales). Significant correlations between the Pain subscale total score and items 31, 32, 33, 43, 44, 47, 48, 49, 50 and 51 (belonging to the other subscales). Significant correlations between the total score of the Nutritional Problems subscale and items 34, 35, 37, 39, 40, 42, 44, 47, 48 and 49 (belonging to the other subscales). Significant correlations between the total score of the Emotional Problems subscale with items 31, 32, 33, 35, 37, 39, 40, 42, 43, 44, 45, 46 and 51 (belonging to the other subscales).

## Discussion

This study allowed the analysis of HRQoL of patients with liver metastasis from colorectal cancer undergoing chemotherapy. The results of sociodemographic data are similar to those of other studies conducted with patients with liver metastasis of colorectal cancer, regarding the sex and age of the participants<sup>(10,12)</sup>. Regarding marital status, the results are equivalent to those of other studies with patients with CRC<sup>(12-15)</sup>, who found predominance in the number of fixed partners, an important condition, because the diagnosis and treatment of cancer brings the patient challenging experiences that can alter their lifestyle. Having an available support network helps to cope with the difficulties of diagnosis and treatment.

Social support is one of the main factors that contribute to coping with the stress, resilience and QOL of cancer patients. The family presence can play important roles in patient care, either

by counseling, accompanying during treatments, or with home care. A study conducted in the city of São Paulo, Brazil, which evaluated the association of stress perception, social support and resilience with QOL demonstrated that patients with CRC undergoing chemotherapy, who have a high level of social support, have improved resilience skills, while QOL increases and stress levels decrease<sup>(14)</sup>.

Regarding the clinical data of the sample, this study indicates that systemic arterial hypertension (SAH) and Diabetes *Mellitus* (DM) were the prevalent comorbidities. These data are similar to a study conducted with the same population profile in the Federal District, Brazil<sup>(13)</sup>, and with the study conducted in Switzerland, which aimed to evaluate the QOL of patients who underwent resection of tumor in the liver, whether or not from CRC; the results showed that 13.8% had DM and 43.8% had some cardiovascular problem<sup>(15)</sup>. The study conducted in northern Iran, which aimed to evaluate the



relationship of psychological stress and QOL of patients surviving CRC, identified that of the 157 study participants, 68.2% had some type of associated comorbidity<sup>(16)</sup>.

The presence or not of comorbidities may influence the prognosis of patients with CRC, as they have a higher chance of cure when metastases are eligible for resection. However, the presence of comorbidities may be a limiting factor, since the risks of postoperative complications increase, recovery is prolonged and additional care is needed<sup>(17)</sup>.

A study conducted in the United Kingdom with 872 patients with CRC showed that the presence of comorbidities is associated with worse overall quality of life, functioning and worsening of symptoms in patients. SAH, arthritis/rheumatism and depression/anxiety were the most common comorbidities. Patients with at least one comorbidity reported having limitations in their daily activities, in addition to having increased fatigue, pain, urinary and intestinal symptoms, and decreased physical, social, emotional cognitive and function functioning. Depression/anxiety presented the highest associations with the worst results. DM and SAH were associated with increased pain and worse physical functioning<sup>(18)</sup>.

In the evaluation of the functional scale domains of the EORTC QLQ-C30, the findings of this study were similar to the study<sup>(10)</sup> conducted with the population of Germany, the United Kingdom and France, and the study conducted in Poland<sup>(12)</sup>, in which the domains with the best scores were of cognitive performance and physical performance. However, unlike this research, emotional function presented better scores in relation to social function, that is, the social domain was the most impaired in the assessment of QOL in these studies<sup>(10,12)</sup>.

When diagnosed with CRC, the patient experiences important changes in lifestyle, such as physical and emotional changes due to pain and discomfort, dependence, low self-esteem and social isolation. Chemotherapy treatment can also potentiate these changes, since the chemotherapy regimen based on fluoropyrimidins

with association with oxaliplatin® for patients with advanced CRC can cause frequent toxicity, which negatively impacts HRQoL and physical, social and emotional well-being<sup>(19)</sup>.

As a consequence of these physical and emotional changes, depression occurs, and even if, at the end of treatment, the results have had good results, they may present limitations, feelings of anguish and distress, mainly due to the fear of recurrence of the disease<sup>(16)</sup>. One of the strategies that help patients improve emotional well-being, providing better treatment adhering and better quality of life, is social support. However, the data from this research showed that social performance values were better only in relation to those of cognitive and emotional performance. Patients with CRC who have more social support have better QOL indices and better results in relation to depression and anxiety<sup>(20)</sup>.

Also in relation to the EORTC QLQ-C30 domains, the results of this study are similar to those of a study conducted in Brazil<sup>(21)</sup> that, when using the QLQ-C30 to evaluate the QOL of patients with CRC undergoing chemotherapy treatment, found higher scores in cognitive function.

The questions related to physical performance aim to evaluate the impact that the symptoms of the disease or the side effects caused by treatment cause on patients' QOL, but drug interventions can minimize them. In the present study, this domain was the least affected in the evaluation of HRQoL. Similar results were found in a study<sup>(12)</sup> that found this domain as the second least affected, both in palliative and hepatectomy treatment. These results may indicate that, often, for the patient, domains related to emotional and social issues have a greater impact on HRQoL.

The results of this research demonstrated, as in two other studies<sup>(10,12)</sup>, that the most affected individual item was sexual activity. Sexual problems are prevalent among patients with CRC, who consider them a severe and distressing symptom. Treatment and long-term side effects can affect the sexual function and intimacy of patients and their partners<sup>(22)</sup>. Moreover, as a consequence of the resection of

the primary tumor, the presence of stoma affects the perception of body image, causing low self-esteem, which impairs quality of life<sup>(13)</sup>.

Regarding the domains of the symptom scales, the reverse should be considered, that is, the higher the score, the worse the QOL. In this sense, the most affected domains were fatigue, pain, nausea and vomiting, and the least affected individual item was dyspnea. Similar results were found in a study that used the same QLQ-C30 instrument<sup>(21)</sup>.

Regarding the QLQ-LMC21 data from the present study, the most affected domains were emotional problems, followed by the fatigue subscale. These results are similar to those found in another study that used the EORTC QLQ-LMC21<sup>(15)</sup>. Cancer-related fatigue directly affects HRQoL. It is one of the most common problems among cancer patients, and can reach 58% to 90% of this population. It can manifest itself as being physical, cognitive or emotional. Its onset occurs at any stage of the disease and may persist for years after completion of treatment. It can be disabling in the performance of daily activities, negatively affecting the HRQoL of these patients<sup>(23)</sup>.

By performing the correlations between the different domains, it was possible to observe a significant correlation of the fatigue domain with items of the emotional functioning subscale, pain and nutritional problems. It can be inferred that fatigue consists of a domain that is related to emotional problems, pain and difficulty in eating.

Pain showed a significant correlation with all items of emotional functioning with items of fatigue, weight loss and nutritional problems. It is a symptom that alters the HRQoL of patients with CRC, becoming a disabling factor in people's lives. This limitation can cause the development of emotional problems, such as depression and anxiety, impairing activities of daily living<sup>(24)</sup>.

Regarding nutritional problems, it was possible to observe significant correlations with emotional problems and pain. One of the side effects of treatment, or consequence of the evolution of the disease itself, is weight loss, diarrhea or constipation. This fact may raise concerns for

patients with CRC, which impairs their HRQoL<sup>(25)</sup>. When evaluating the items of the emotional problems scale, it is possible to observe that this domain correlates significantly with almost all items belonging to the other scales.

Thus, it is possible to observe the importance of evaluating HRQoL of patients with liver metastasis in an integral way, since all the domains evaluated present significant correlations with each other. Therefore, when one of the domains is altered, other domains may also be impaired, demonstrating the importance of multidimensionality in the evaluation of HRQoL in oncology.

The main limitation of this research is not to evaluate HRQoL from different groups, for example, patients with liver metastasis of CRC undergoing palliative treatment or eligible for surgery, and the comparison of QOL values before and after treatment. The characteristics of the study population did not allow this analysis.

This study may help health professionals to develop care strategies aimed at the most affected domains and thus provide a better QOL for patients with liver metastasis from colorectal cancer undergoing chemotherapy.

## Conclusion

The results of this study demonstrated that patients with liver metastasis of CRC undergoing chemotherapy have lower QOL indices in relation to emotional function in both questionnaires, followed by function performance and social performance. Physical and cognitive performance were the least affected scales. In addition, sexual activity was the most affected item and, on the scale of symptoms, pain, nausea and vomiting were the most frequent. When performing correlation analyses, it was possible to observe that the emotional factor is related to other domains belonging to the QOL assessment, such as items of the pain scale, nutritional problems and fatigue. These results demonstrated how HRQoL assessment items are correlated with each other and can directly interfere in the lives of these patients.

The patients presented alterations in the quality of life domains. Thus, knowing the changes in the quality of life of colorectal cancer patients with liver metastasis is a prerequisite to offer care focused on their real needs.

### Collaborations:

1 – conception, design, analysis and interpretation of data: Dabna Hellen Tomim, Luciana de Alcântara Nogueira, Paulo Ricardo Bittencourt Guimarães and Luciana Puchalski Kalinke;

2 – writing of the article and relevant critical review of the intellectual content: Dabna Hellen Tomim, Luciana de Alcântara Nogueira, Francisco José Koller, Celina Angélica Mattos Machado and Luciana Puchalski Kalinke;

3 – final approval of the version to be published: Dabna Hellen Tomim, Luciana de Alcântara Nogueira and Luciana Puchalski Kalinke

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