



## Empirical Articles

### Quality of Life in Colorectal Cancer Outpatients

Qualidade de Vida em Pacientes Externos com Cancro Colorretal

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#### Abstract

**Aim:** This study aimed to longitudinally analyze Quality of Life and its association with physical and psychosocial factors of patients with colorectal cancer.

**Method:** Fifty-one outpatients undergoing treatment for colorectal cancer were elected for convenience and were evaluated twice during their treatment. Evaluations were performed for Quality of Life, as well as socio-demographic, diagnostic and therapeutic variables. Afterwards, descriptive and inferential statistical analysis were performed, establishing the appropriate comparisons.

**Results:** The results identified a characteristic profile with a relatively homogeneous distribution: 51% were men with an average age of 60.1 years old (SD = 9.3 years) at the baseline. In general, concerning psychosocial aspects, there was a higher Quality of Life than other studies with the same population, in addition to a significant improvement over time in all subscales of performance and symptoms. Furthermore, it was evidenced that the physical aspects considerably influenced the self-report of the Quality of Life.

**Conclusion:** The recognition of the interferences that physical aspects pose to Quality of Life, should permeate the practices of teams involved in the care of these patients.

*Keywords:* quality of life, colorectal cancer, chemotherapy

#### Resumo

**Objetivo:** Este estudo teve como objetivo analisar longitudinalmente a qualidade de vida e sua associação com fatores físicos e psicossociais, de pacientes com cancro colorretal.

**Método:** Cinquenta e um pacientes externos submetidos a tratamento para cancro colorretal foram selecionados por conveniência e avaliados duas vezes durante o tratamento. As avaliações foram realizadas para Qualidade de Vida, bem como variáveis sociodemográficas, diagnósticas e terapêuticas. Posteriormente, foram realizadas análises estatísticas descritivas e inferenciais, estabelecendo as comparações apropriadas.

**Resultados:** Os resultados identificaram um perfil característico com uma distribuição relativamente homogênea: 51% eram homens com idade média de 60.1 anos (DP = 9,3 anos) na amostra de base. Em geral, quanto aos aspetos psicossociais, foi apresentada maior Qualidade de Vida do que noutros estudos com a mesma população, para além de uma melhoria significativa ao longo do tempo em todas as subescalas de desempenho e sintomas. Além disso, constatou-se que os aspetos físicos influenciaram consideravelmente o autorrelato da Qualidade de Vida.

**Conclusão:** O reconhecimento das interferências que aspetos físicos colocam sobre a Qualidade de Vida, deve permear as práticas das equipas envolvidas no cuidado desses pacientes.

*Palavras-Chave:* qualidade de vida, cancro colorretal, quimioterapia

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It was estimated that in 2015, more than 579,000 new cancer cases would occur in Brazil. Among these cases, approximately 14,180 will be of colon and rectal cancer (colorectal cancer) in men and 15,960 in women. The mortality rates of colon and rectal cancer in 100,000 inhabitants found in the period from 2010 to 2011 were: 9.05 and 7.11 in Brazil; 10.60 and 8.16 in the world and 12.40 and 12.49 in the state of Rio Grande do Sul (men and women respectively) (Instituto Nacional do Câncer José Alencar Gomes da Silva [INCA], 2014).

Colorectal cancer presents features that may include surgical intervention, chemotherapy, radiotherapy and in some cases the use of monoclonal antibodies (concomitant to chemotherapy), these treatments can occur separately, jointly or continuously (Sociedade Brasileira de Oncologia Clínica [SBOC], 2011).

Quality of Life is a definition with especially important multidimensional foundations. When we treat patients with advanced cancer this becomes the goal of the treatment, both its maintenance and its improvement (Wong, Lam, Poon, & Kwong, 2013). Factors such as chemotherapy, radiotherapy and spiritual well-being can potentially interfere, which should be considered when the focus are on the most effective palliative care (Wong et al., 2013). In addition, Quality of Life is an indicator of mortality and survival, as well as an indicator of improvement in certain functions of the patient's life, in addition to making it possible to determine the efficacy of treatments (Chou, Stewart, Wild, & Bloom, 2012; Efficace, Bottomley, Vandvoorden, & Blazeby, 2004; Meeske et al., 2007).

In this sense, the identification of which domains of Quality of Life are affected in the patients with colorectal cancer has evidenced that the Quality of Life scores are in general satisfactory (Nicolussi & Sawada, 2009). There are, however, indicative of significant interferences in the domains and subscales: emotional performance, pain symptoms, insomnia, fatigue and financial difficulties (Nicolussi & Sawada, 2009). Studies on this subject also shows bottom inferior female performance where the members reached lower scores of cognitive, emotional performance and in symptoms such as: pain, insomnia and fatigue, constipation and loss of appetite (Nicolussi & Sawada, 2009).

From these evaluation subscales we can see a great exception in palliative care patients whose condition has a negative impact on Quality of Life (Färkkilä et al., 2013). We should also highlight that patients in radiotherapy had higher pain scores. Finally, the asymptomatic ones were those that obtained better global Quality of Life scores (Färkkilä et al., 2013).

In Malaysia, a study with patients in stages III and IV of colorectal cancer who proposed to evaluate Quality of Life using the C-30 instrument of the European Organization for Treatment of Cancer Research (EORTC) identified that emotional, cognitive and social performance deteriorates along with the disease progression (Wan Puteh et al., 2013). In addition, patients with advanced disease show more pain, dyspnea, diarrhea, and financial difficulties than the patients without advanced disease (Wan Puteh et al., 2013).

The results are similar to those found in a Chinese study, even if it is with a different instrument for measuring Quality of Life (Wong et al., 2013). However, in the Chinese population, the identification of colorectal cancer patients presented better performance in the mental domain than the value established for the Chinese general population (Wong et al., 2014).

Another study on this same clinical population showed that Quality of Life in Malaysia is compared to developed countries, and highlighted a difference where the female has worse pain, fatigue and dyspnea scores (Natrah, Ezat, Syed, Rizali, & Saperi, 2012).

In addition, the K-RAS gene when in its wild form is related to a worse Quality of Life, when compared to its mutated form, soon its identification becomes important for the definition of oncological care behaviors (Ooki et al., 2014; Ringash et al., 2014).

On the other hand, the performance status (PS) is a global assessment of the patient performed by the professional of their functional capacity, which directly affects biopsychosocial health in this way, making it a valuable way of health assessment (Dajczman et al., 2008).

Thus, the objective of this study was to identify socio-demographic, psychosocial and physical factors that may be related to Quality of Life and other clinical characteristics in patients with colorectal cancer because there are a great number of patients who suffer severely from this type of cancer.

## Method

### Participants

The study sample consisted in 51 patients with colorectal cancer diagnosed and who were on antineoplastic therapy at baseline and at follow-up. The sample was chosen for convenience. Colorectal cancer diagnosed and who were on antineoplastic therapy at baseline and at follow-up.

The latest one performed with the survivors, who may be undergoing treatment or only under medical supervision. The baseline occurred between July 2010 and September 2011 in a private clinic, located in Porto Alegre, Brazil.

The follow-up occurred between October 2013 and April 2014. In order to calculate the sample size, it was used the sample calculation program of the Laboratory of Epidemiology and Statistics of the University of São Paulo (LEE-USP), which is a program used to facilitate the process of sample size, in order to find the difference between the estimates of the means of the pre (T1) and post of the Quality of Life score.

A standard deviation of 10.0% was considered; level of significance of 95% ( $\alpha = 0.05$ ); a sampling power of 80% ( $1-\beta$ ) in order to detect a minimum difference of 7.8 in the functional scale variation. The result for the minimum size sample test was 19 individuals at follow-up stage. It was considered as inclusion criteria: (a) to have agreed and signed the informed consent form to participate in the study; (b) to be aged equal or greater than 18 years; (c) to have done at least the first course of antineoplastic treatment; (d) to have enough time to answer the questionnaire; (e) not to have cognitive impairment identified at a clinical interview. The study was approved by the Research Ethics Committee N ° 2010/068.

## Measures

The participants were evaluated by a set of instruments, which included:

### Medical Records

Through the analysis of Medical Records we obtained information such as staging, presence of ostomy, time of diagnosis, K-RAS mutation, protocol of antineoplastic treatment adopted and body mass index.

### Socio-Demographic Questionnaire

The instrument is used to outline a profile of the participants. In this questionnaire it will be gathered data such as sex, schooling, marital status, date of birth, children, income, address.

### C-30 Quality of Life Questionnaire

It is a scale, which evaluates Quality of Life in patients with cancer developed by the European Organization for Research and Treatment of Cancer (EORTC). It consists of 30 items divided into performance and symptom subscales, namely: functional subscales (which include physical, functional, emotional, cognitive, and social dimensions), subscales of symptoms (fatigue, nausea and vomiting, pain, dyspnea, insomnia, loss of appetite, constipation, diarrhea, financial difficulties) and a global health Quality of Life.

The first 28 are arranged in Likert four-point scales, where 1 = *not* and 4 = *a lot*. The last two are the Likert type of seven points, where 0 is *bad* and 7 is *great*. It was adapted and validated for the Portuguese language of Brazil by Paiva and collaborators (2014). Adequate internal consistency with its constructs showing Cronbach's alpha greater than 0.7 (with the exception of the cognitive subscales = 0.57, social = 0.69 and nausea and vomiting 0.68 this results is a limitation; Aaronson et al., 1993; Fayers, Bottomley, & EORTC, 2002; Paiva et al., 2014).

The reference values of the Quality of Life C-30 contained in the EORTC reference manual presented by Scott et al. (2008) were adopted as a parameter only the scoring corresponding to the population with colorectal cancer, which are described in the Table 1.

Table 1

*EORTC's Reference Score Values for Quality of Life C-30 Colorectal Cancer Patients*

C-30 subscale	<i>M</i>	<i>SD</i>
Health and overall QoL	60.7	23.4
Physical Functioning <sup>a</sup>	79.2	21.1
Functional Role <sup>a</sup>	70.4	32.8
Emotional Functioning <sup>a</sup>	68.9	24.5
Cognitive Functioning <sup>a</sup>	85.2	20.0
Social Functioning <sup>a</sup>	76.0	28.6
Fatigue <sup>b</sup>	34.7	28.4
Nausea and vomiting <sup>b</sup>	7.3	17.2
Pain <sup>b</sup>	24.0	29.6
Dispynea <sup>b</sup>	17.4	26.3
Insomnia <sup>b</sup>	30.5	32.6
Loss of appetite <sup>b</sup>	19.1	30.2
Constipation <sup>b</sup>	15.8	27.9
Diarrhea <sup>b</sup>	16.6	27.6
Financial difficulties <sup>b</sup>	13.6	26.3

<sup>a</sup>On functioning subscales high scores mean better results. <sup>b</sup>On symptoms subscales high scores mean worst results.

### Performance Status of Eastern Cooperative Oncology Group (PS-ECOG)

*Performance Status ECOG* is a five-point scale widely used in clinical study and practice by the medical community and has a score ranging from 0 (*totally ambulatory, without physical symptoms*); 1 (*Totally outpatient, but with some symptoms*); 2 (*Requires < 50% of agreed time to rest*); 3 (*Requires > 50% of agreed time to rest*); 4 (*Bedridden*). As a criterion for the interpretation of this instrument, we can assume that values lower than lower than 2 suggest high performance and that equal or greater than two indicates low performance (Ma et al., 2010; Oken et al., 1982).

### Visual Analog Pain Scale

It is a visual analogue scale, which is a 10 cm line, where on the far left is zero (*no pain*) and on the far right is 10 (*the worst pain you could imagine*). The patient is instructed to mark where (0 to 10) the pain he is feeling at the moment would be. The Visual Analog Scale is widely used and considered reliable for the measurement of acute and cancer-related pain (Bird & Dickson, 2001).

### Hospital Anxiety and Depression Scale (HADS)

It is a scale which assesses depressive and anxiety symptoms developed by Zigmond and Snaith (1983) and later validated for Brazilian Portuguese by Botega, Bio, Zomignani, Garcia, and Pereira (1995), where it presented internal consistency ranging from 0.68 to 0.77. It is constituted of 14 separate items in depressive symptoms of anxiety and has as peculiarity that are considered exclusively psychic symptoms as their constructs. Anxiety and depression are considered in separate subscales greater than or equal 8 and clinically important scores of anxiety and depression symptoms are greater than or equal 11 and indicate clinically important levels of symptoms (Botega, Bio, Zomignani, Garcia, & Pereira, 1995).

## Statistical Analyses

The data were compiled and processed in the statistical software SPSS 17 and the level of significance adopted was 95%.

Results were presented by means of the central tendency (average and median) and variability (standard deviation, range and interquartile range), as well as absolute (*n*) and relative (%) distributions.

The symmetry of the continuous distributions was evaluated by the Kolmogorov-Smirnov test. The comparison of the categorical variables between the baseline and follow-up evaluations was performed by the McNemar test. The Wilcoxon test was used for comparisons between continuous variables, since the data distribution of the variables involved was characterized as asymmetric.

## Results

Considering the results (see [Table 2](#)) obtained on the baseline data, it was found that the number of male participants, 51.0% (*n* = 26), was slightly higher.

Table 2

*Distribution for Sex, Age, Marital Status, Schooling, Occupation, Religion, Cohabitation, Leisure, Physical Activity*

Characteristic	Baseline ( <i>n</i> = 51)	Follow-up ( <i>n</i> = 25)
<b>Sex, <i>n</i> (%)</b>		
Male	26 (51.0)	
Female	25 (49.0)	
<b>Age, <i>M</i> ± <i>SD</i>, <i>Mdn</i> (Range)</b>	60.1 ± 9.3, 59.0 (37 - 83)	61.4 ± 8.1, 61.0 (51 - 86)
<b>Marital Status, <i>n</i> (%)</b>		
Single	11 (21.6)	8 (32.0)
Married/Civil Partnership	37 (72.6)	15 (60.0)
Widowed	3 (5.9)	2 (8.0)
<b>Schoolarity, <i>n</i> (%)</b>		
Elementary	6 (12.0)	
High school	29 (58.0)	
College	15 (30.0)	
Missing data	1 (2.0)	
<b>Occupation, <i>n</i> (%)</b>		
Retired	26 (51.0)	
Active workers	25 (49.0)	
<b>Religion, <i>n</i> (%)</b>		
Catholic	30 (58.8)	
Protestant	7 (13.7)	
Spiritualist	8 (15.7)	
Afro Brazilian	2 (3.9)	
Atheist	4 (7.8)	

Characteristic	Baseline (n = 51)	Follow-up (n = 25)
<b>Grouped cohabitation, n (%)</b>		
Nobody	6 (11.8)	
1 person	12 (23.5)	
2 people or more	33 (64.7)	
<b>Leisure, n (%)</b>		
Yes	44 (86.2)	
No	7 (13.7)	
<b>Physical Activities (Yes/No), n (%)</b>		
No	35 (68.6)	
Yes	16 (31.4)	
<b>Physical Activities, n (%)</b>		
No activity	35 (68.6)	
Hiking	14 (27.5)	
Stretching	1 (2.0)	
Soccer	1 (2.0)	
<b>Grouped Frequency, n (%)</b>		
Sporadically or once a week	3 (12.5)	
3 to 5 times a week	8 (43.8)	
Six times a week	5 (6.3)	

Note. Percentages (%) are relative to the number of valid cases. For missing data percentages (%) are relative to the number of all cases.

The average age was estimated at 60.1 ( $\pm$  9.3) years old, and in the follow-up the estimate was 61.4 ( $\pm$  8.1) years old. Marital status was predominant in the baseline, 72.6% ( $n$  = 37) as well as in follow-up, 56.0% ( $n$  = 14). Also, it was verified in the baseline assessment that the schooling which was most present was high school, observed in 58.0% ( $n$  = 29) of the sample. Regarding the occupation, those who declared themselves retired made up 51.0% ( $n$  = 26) of the sample, remaining 49.0% ( $n$  = 25) of active workers. The Catholic religion was mentioned by 58.8% ( $n$  = 30) of the participants.

From data obtained without medical records following a clinical and outcome characterization (Table 3).

The K-RAS gene prevailed in cases where this data was not identified (Table 3), reaching 51.0% ( $n$  = 26), however, it was found that 27,5% ( $n$  = 14) were wild classification and 21,5% ( $n$  = 11) mutated ones.

The Colon diagnosis was the most observed, representing 66.7% ( $n$  = 34) and in what is referred to the time of diagnosis, the median was 4.2 years (1st-3rd quartile: 3.3-6.7 years), with an average of 5.2 ( $\pm$  2.5) years.

In relation to staging see Table 3, half of the concentrated sample, without stage IV, 50.0% ( $n$  = 25), following stage III, 34.0% ( $n$  = 17) and II, 12.0% ( $n$  = 6), was detected as wild-type, 27.5% ( $n$  = 14) and mutated, 21.5% ( $n$  = 11). Of the 51 baseline cases, in 26 patients the death was confirmed, and in the remaining 25 investigated the survival was confirmed (see Table 3).

Table 3

Distribution for IMC, Death, KRAS, Diagnosis, Diagnostic Time and Staging (N = 51)

Variable	Values
<b>IMC (kgm<sup>2</sup>), M ± SD, Mdn (Range)</b>	25.1 ± 4.4, 23.9 (15.6 – 35.2)
<b>Death, n (%)</b>	
Yes	26 (51.0)
No	25 (49.0)
<b>KRAS, n (%)</b>	
Mutated	11 (21.5)
Wild	14 (27.5)
Not identified	26 (51.0)
<b>Diagnosis, n (%)</b>	
Colon	34 (66.7)
Rectal	17 (33.3)
<b>Time of diagnosis, M ± SD, Mdn (Range)</b>	5.2 ± 2.5, 4.2 (2.4 – 13.7)
<b>Staging, n (%)</b>	
II	6 (12.0)
III	17 (34.0)
IV	25 (50.0)
Unknown	2 (4.0)
Missing data	1 (2.0)

Note. Percentages (%) are relative to the number of valid cases. For missing data percentages (%) are relative to the number of all cases.

Our results regarding the presence of ostomy in the baseline see Table 4, 42.9% ( $n = 18$ ) of the patients experienced this reality, while in *follow-up* this proportion was of 19%.

Regarding the treatment see Table 4, information was observed only at follow-up. In the chemotherapy protocols, the most observed baseline chemotherapy were FOLFOX, 33.3% ( $n = 17$ ), FOLFIRI, 23.5% ( $n = 12$ ), and FOLFIRI + Cetuximab, 17.7% ( $n = 9$ ). Regarding the treatment see Table 4, information was observed on baseline and follow-up. In the chemotherapy protocols, the most observed baseline chemotherapy were FOLFOX, 33.3% ( $n = 17$ ), FOLFIRI, 23.5% ( $n = 12$ ), and FOLFIRI + Cetuximab, 17.7% ( $n = 9$ ). The chemotherapy protocols were confirmed in 23.3% ( $n = 7$ ) of the sample in the follow-up.

In the follow-up assessment, of the six cases with valid answers, in four (66.7%) FOLFIRI was used. When asked about a presence of pain, it was confirmed in 21.6% ( $n = 11$ ) at baseline and 26.1% ( $n = 6$ ) within follow-up.

Regarding the reported cases see Table 4, the baseline for the median for pain intensity of 3.0 points with an average of 3.5 ( $\pm 2.1$ ), whereas, to accompany a median was 5.5 with an average of 5.7 ( $\pm 2.3$ ) points.

Considering the ECOG symptom scale Table 4, predominant in the sample was "Normal activity", with proportions of 84.3% ( $n = 43$ ) at baseline and 87.0% ( $n = 20$ ) at follow-up. Regarding the anxiety and depression pitfalls, information collected during the follow-up, a median was 4.0 points with an average of 4.4 ( $\pm 3.1$ ) points and 2.0 points with an average of 3, 5 ( $\pm 3.6$ ) points, respectively.



Table 4

*Absolute and Relative Distribution for Ostomy, Treatment, Antineoplastic Drug, Visual Analog Scale, ECOG, Anxiety and Depression Core in Both Moments of Evaluation*

Variable	T1 (n = 51) Basal	Paired assessments		p
		T1 (n = 25)	T2 (n = 25) follow up	
<b>Ostomy, n (%)</b>				0.011
Yes	18 (42.9)	11 (50.0)	4 (19.0)	
No	24 (57.2)	11 (50.0)	17 (81.0)	
Missing data, n (%)	9 (17.6)	3 (12.0)	4 (16.0)	
<b>Treatment, n (%)</b>				0.009
Yes	51 (100.0)	25 (100.0)	7 (28.0)	
No	0 (0.0)		18 (72.0)	
<b>Chemotherapy drug, n (%)</b>				—
5-Fu+Folinic Acid	5 (9.8)	5 (20.0)		
FOLFOX	17 (33.3)	10 (40.0)		
FOLFIRI	12 (23.5)	3 (12.0)	4 (66.7)	
FOLFIRI + Cetuximab	9 (17.7)	2 (8.0)		
FOLFOX + Bevacizumab	3 (5.9)	2 (8.0)	2 (33.3)	
FOLFIRI + Bevacizumab	4 (7.8)	2 (8.0)		
Mitomycin+ 5-Fu	1 (2.0)	1 (4.0)		
Missing data, n (%)			19 (76.0)	
<b>Pain Presence (EVA), n (%)</b>				0.788
No	40 (78.4)	21 (84.0)	17 (73.9)	
Yes	11 (21.6)	4 (16.0)	6 (26.1)	
Missing data, n (%)			2 (8.0)	
<b>Visual Analog Scale (Pain)<sup>a</sup>, M ± SD, Mdn (Range)</b>	3.5 ± 2.1, 3.0 (1.0 – 7.0)	4.2 ± 2.2, 5.0 (2.0 – 5.7)	5.7 ± 2.3, 5.5 (3.0 – 8.0)	0.123
<b>ECOG – symptomatic scale, n (%)</b>				—
Normal activity	43 (84.3)	20 (87.0)	20 (87.0)	
Symptomatic but outpatient	6 (11.8)	1 (4.0)	1 (4.3)	
Bedridden more than 50% of the time	2 (3.9)	0 (0.0)		
Bedridden less than 50% of the time	0 (0.0)	2 (8.0)	2 (8.7)	
Missing data, n (%)		2 (8.0)	2 (8.0)	
<b>Score A (anxiety)<sup>a</sup>, M ± SD, Mdn (Q<sub>1</sub>-Q<sub>3</sub>)</b>			4.4 ± 3.1, 4.0 (0.0 – 11.0)	—
<b>Anxiety – classification, n (%)</b>				—
Normal (up to 7)			18 (78.3)	
With anxiety (mild or moderate)			5 (21.7)	
Missing data, n(%)			2 (8.0)	
<b>Score D (Depression)<sup>a</sup>, M ± SD, Mdn (Q<sub>1</sub>-Q<sub>3</sub>)</b>			3.5 ± 3.6, 2.0 (0.0 – 12.0)	—
<b>Depression – classification, n (%)</b>				—
Normal (up to 7)			19 (82.6)	
With depression mild (mild or moderate)			4 (17.3)	
Missing data, n (%)			2 (8.0)	

*Note.* Percentages (%) are relative to the number of valid cases. For missing data percentages (%) are relative to the number of all cases.

<sup>a</sup>Depression and anxiety scores were assessed only at follow-up.

As for a scale for anxiety and depression, predominant in the two characteristics of a normal classification: depression: 82.6% ( $n = 19$ ) and anxiety, 78.3% ( $n = 18$ ).

Considering the analysis of the variables from Table 5 on the cases which in T1 that were present at the follow up (T2), it was verified that in Ostomy there was a significant reduction ( $p = 0.011$ ) in the number of cases with this characteristic in T2, 19.0% ( $n = 4$ ) compared to T1, 50.0% ( $n = 11$ ).

At the time of treatment, all 25 patients were confirmed in T1, but in T2 this number changed to seven (28.0%), that is, there was a significant reduction ( $p = 0.009$ ) in the number of patients in T2 treatment. The presence of pain in T1 was confirmed by 16.0% ( $n = 4$ ) of patients, while in T2 there was a slight increase, 26.1% ( $n = 6$ ) ( $p = 0.788$ ). Other comparisons of the paired data, based on the cases that reached the follow-up, were not representative, as shown in Table 5.

Table 5

Mean, Standard Deviation and Median for QLQ C-30

Quality of Life – QLQ C30	Paired assessments <sup>a</sup>									p
	T1 (N = 51)			T1 (n = 23)			T2 (n = 23)			
	M	SD	Mdn	M	SD	Mdn	M	SD	Mdn	
Average global health / Quality of Life (29 and 30)	76.6	17.0	75.0	80.1	16.0	75.0	86.2	13.9	83.3	0.108
<b>Functional Scale</b>										
Physical functioning (1 to 5)	80.9	23.1	93.3	79.7	24.9	93.3	87.2	16.8	93.3	0.195
Role Functioning (6 and 7)	81.7	23.6	83.3	81.2	18.3	83.3	85.5	27.2	100.0	0.520
Emotional functioning (21 to 24)	72.9	21.9	75.0	70.3	22.3	66.7	74.5	29.4	83.3	0.468
Cognitive Functioning (20 to 25)	82.4	23.4	100.0	80.4	23.9	83.3	84.1	26.3	100.0	0.496
Social Functioning (26 and 27)	72.6	26.6	66.7	71.0	24.7	66.7	86.2	26.4	100.0	0.031
<b>Symptoms Scale</b>										
Fadiga (10, 12 and 18)	25.0	23.6	22.2	29.5	25.0	22.2	20.3	25.4	11.1	0.193
Nausea / vomit (14 and 15)	14.4	20.6	0.0	17.4	21.0	16.7	8.0	15.0	0.0	0.056
Pain (9 and 19)	11.8	22.9	0.0	12.3	25.7	0.0	18.8	33.8	0.0	0.329
Dyspnea (8)	8.5	18.7	0.0	10.1	23.4	0.0	2.9	9.6	0.0	0.057
Insomnia (11)	25.5	30.3	0.0	31.9	31.0	33.3	18.8	31.5	0.0	0.083
Loss of appetite (13)	20.3	28.3	0.0	21.7	29.5	0.0	2.9	13.9	0.0	0.009
Constipation (16)	24.8	31.9	0.0	20.3	29.7	0.0	13.0	26.1	0.0	0.381
Diarrhea (17)	18.3	25.2	0.0	14.5	19.7	0.0	8.7	23.0	0.0	0.329
Financial Struggle (28)	20.9	32.6	0.0	21.7	31.2	0.0	11.6	25.8	0.0	0.245

<sup>a</sup>Wilcoxon test.

In the baseline Quality of Life results (Table 5), it was found that the average score for general quality of life was  $76.6 \pm 17.0$  ( $p = 0.108$ ), an estimate that reference values for this population ( $60.7 \pm 23.4$ ).

In the evaluation of the performance subscales that make up the instrument, the highest score occurred in the cognitive performance subscale ( $82.4 \pm 23.4$ ; median: 100.0), while the lowest average was identified in the emotional performance subscale ( $72.9 \pm 21.9$ , median: 75.0), these results, according to the reference values of the instrument for this clinical population. On the results of the symptom scale, the average scores indicated a higher impairment of quality of life (greater symptomatology) in the subscales of insomnia ( $25.5 \pm 30.3$ , me-

dian: 0.0), fatigue ( $25.0 \pm 23, 6$ ; median: 0.0) and constipation ( $24.8 \pm 31.9$ ; median: 0.0), these results were consistent with EOTRC reference values for this condition.

Based on the data obtained in follow-up, these were paired and compared to those observed at the baseline and, according to the results presented in [Table 5](#), for the overall quality of life score, it is observed that the average in the follow-up ( $86.2 \pm 13.9$ ; median: 83.3) was higher than in the baseline ( $80.1 \pm 16.0$ ; median: 75.0). However, the difference observed was not significant ( $p = 0.108$ ) but it appears that a tendency.

In the performance subscale, the significant difference was attributed to the social performance subscale ( $p = 0.031$ ), indicating that the average follow-up score ( $86.2 \pm 26.6$ ; median: 100.0) was significantly higher than baseline ( $71.1 \pm 24.7$ , median: 66.7), that is, in the follow-up there was an improvement in the quality of life of the investigated patients.

Regarding the other performance subscales, although the average scores were higher at follow-up, the differences were not significant when compared to the baseline means.

Concerning the subscales of symptoms, a significant difference in loss of appetite was detected ( $p = 0.009$ ) where the average score was significantly lower at follow-up ( $2.9 \pm 13.9$ ; median: 0.0) when compared to the baseline ( $21.7 \pm 29.5$ ; median: 0.0). That is, the paired investigators presented a lower impairment of this symptom at follow-up. In the other subscales of the symptomatology, the average score was lower at follow-up, however, the observed differences between baseline and follow-up were not significant.

Concerning the subscales of symptoms, a significant difference in loss of appetite was detected ( $p = 0.009$ ), where the average score was significantly lower at follow-up ( $2.9 \pm 13.9$ ; median: 0.0) when compared to the baseline ( $21.7 \pm 29.5$ , median: 0.0). That is, the paired investigators presented a lower impairment of this symptom at follow-up.

In the other subscales of the symptomatology, the average score was lower at follow-up, however, the observed differences between baseline and follow-up were not significant.

It should be noted that, in the subscales, nausea / vomiting and dyspnea, borderline significance was observed ( $0.05 < p < 0.10$ ), suggesting that the average follow-up score may be lower, indicating a tendency the symptomatology may be lower in this evaluation compared to the baseline.

In the financial difficulty subscale, the observed differences between the average scores were not significant in this sample.

## Conclusions

In the present study, patients with diagnosis and treatment for colorectal cancer were evaluated over time, and this allowed us to characterize the population in order to allow the recognition of possible factors that may influence Quality of Life. Both physical and psychosocial aspects have proved to be representative of a possible reality because indicates tendency. As this clinical population performed better than the C-30 reference values presented by EORTC, it is understood that these higher scores portray characteristics of private health care, which has multiprofessional care, without burden to the patient ([Scott et al., 2008](#)).

Over time, the social function improved significantly, accompanied by an improvement in the quality of life of these patients. This can be attributed to factors such as adaptation processes and resilience that may be acting moderating or mediating favouring Quality of Life and its domains, corroborating studies that indicate that the age factor favours adaptation and resilience in patients (Cohen, Baziliansky, & Beny, 2014).

The follow-up scores of the subjects ( $n = 6$ ) showed that the subjects achieved significant Quality of Life-related improvements in social constructs, nausea, dyspnea, insomnia, loss of appetite, improved over time, but the improvements identified only refer to these six people. This finding corroborates the studies with survivors of colorectal cancer although, in contrast to not showing risk factors for poor Quality of Life such as: advanced stage of disease, presence of ostomy, rectal cancer, fatigue, smoking, being single, concerning ostomized patients, the presence of ostomy in the follow-up was reduced to only four subjects who did not show to be negatively impacting their Quality of Life, since there were no significant losses in Quality of Life (Chambers et al., 2012).

However, when we compared the baseline ( $n = 18$ ) ostomized patients presented better cognitive performance, less pain and less constipation, besides other symptoms and performances in subscales which were not statistically expressive, but which suggest that depending on the ostomy, possibly the care is greater with symptomatological issues, which establishes contradiction with equivalent studies (Grant et al., 2011; Nicolussi & Sawada, 2009).

Considering that in the study population it was not possible to verify that ostomy implies impairment of quality of life at both the baseline and follow-up (despite the suggestion to the contrary), the methodological limitation is pointed out because the confrontation can not be performed with the time of ostomization. This may have compromised the strength of the analyses and their explanatory power. However, these findings are supported by the evidence that adaptation occurs in two years in ostomy patients (Salles, Becker, & Faria, 2014).

However, although quality of life is generally good, as indicated by a systematic review with survivors of colorectal cancer, it indicates that they have specific physical and psychological problems. Thus, studies suggest that Quality of Life may serve to identify survivors with special needs, but considers that further studies focused on these problems are necessary (Jansen, Koch, Brenner, & Arndt, 2010).

The present study presented as limitations the sample loss resulting from the characteristic of the population constituted, in the majority, by patients with unfavorable prognoses. In addition the study shows limitations due to the no parametric tests used to analyze the data. New studies with a larger number of participants are needed to characterize the specificities of patients with Colorectal Cancer in the population of southern Brazil, considering different perspectives of cancer care, both in the public and private health systems.

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## Competing Interests

The authors have declared that no competing interests exist.

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