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Ostomy time and nutrition status were associated on quality of life in patients with colorectal cancer

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ABSTRACT

Introduction: Colorectal cancer frequency increases each year and consequently the number of ostomies, a procedure that helps in the treatment of colorectal cancer but has an impact on quality of life. Studies evaluating the impact of ostomy time and nutritional status on the quality of life of colostomized patients with colorectal cancer are scarce in the literature. So, the aim of this study was to evaluate the association ostomy time and nutritional status on quality of life in colostomized colorectal cancer patients.

Methods: A cross-sectional study was conducted with 97 colostomized patients due to colorectal cancer from a reference service. Socioeconomic, demographic, clinical data were obtained. European Organisation for Research and Treatment of Cancer questionnaires EORTC-QLQ30 and EORTC-QLQ-CR29 were used to analyse the quality of life. Statistical significance analysis was performed using the Wilcoxon's non-parametric or Chi–Square test.

Results: Of the 97 individuals, 50.5% were female, 64.9% were over 60 years old, 67.4% have ostomy for less than 1 year. Half of the patients had some nutritional status inadequacy: 24.2% were malnourished, 17.9% overweight and 8.4% obese. Shorter ostomy time was associated with role function, blood or mucus in stools, stoma care problems and men's sexual interest, while malnutrition was associated with concern about weight.

Conclusions: Ostomy time and nutrition status were associated with quality of life in some domains, such as role function, insomnia, appetite loss, abdominal pain, buttock pain, bloating, hair loss, taste loss have an impact together with the nutritional status on the quality of life in patients colostomized colorectal cancer.

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Tempo de estomia e estado nutricional são associados com a qualidade de vida em pacientes com câncer colorretal

Palavras-chave:
Câncer colorretal
Estomia
Estado nutricional
Qualidade de vida

RESUMO

Introdução: A frequência do câncer colorretal aumenta a cada ano e, consequentemente, aumenta o número de estomias, procedimento que auxilia no tratamento do câncer colorretal, porém impacta na qualidade de vida. Estudos que avaliam o impacto do tempo de estomia e do estado nutricional na qualidade de vida de pacientes colostomizados com câncer colorretal são escassos na literatura. Assim, o objetivo deste estudo foi avaliar a associação entre tempo de estomia e estado nutricional e qualidade de vida em pacientes colostomizados por câncer colorretal.

Métodos: Participaram deste estudo transversal 97 pacientes colostomizados por câncer colorretal de um serviço de referência. Dados socioeconômicos, demográficos e clínicos foram obtidos. Os questionários da Organização Europeia para Pesquisa e Tratamento do Câncer EORTC-QLQ30 e EORTC-QLQ-CR29 foram utilizados para analisar a qualidade de vida. A análise de significância estatística foi realizada usando o teste não paramétrico Wilcoxon ou teste Qui-Quadrado.

Resultados: Dos 97 indivíduos, 50.,5% eram do sexo feminino, 64.,9% tinham mais de 60 anos, 67.,4% com estomia há menos de 1 ano. Metade dos pacientes apresentava inadequação do estado nutricional: 24.,2% estavam desnutridos, 17.,9% sobrepeso e 8,4% obesos. O menor tempo de estomia foi associado ao desempenho funcional, sangue ou muco nas fezes, problemas em cuidar da estomia e interesse sexual dos homens, enquanto a desnutrição foi associada à preocupação com o peso.

Conclusão: A cirurgia de estomia esteve associada à qualidade de vida em alguns domínios, como desempenho funcional, insônia, perda de apetite, dor abdominal, dor nas nádegas, perda de cabelo, perda do paladar, e tem um impacto junto ao estado nutricional da qualidade de vida em pacientes colostomizados por câncer colorretal.

Introduction

Colorectal cancer (CRC) has a high incidence rate across in the world and in Brazil. According to Global Cancer Statistics, in 2018, the incidence rate of CRC was 10%, and it was the third most frequently diagnosed cancer in males and the second most frequently diagnosed cancer in females.[1] In 2017, 18,867 people died of CRC in Brazil alone. The estimate for Brazil in 2020 is 20,520 new cases in men and 18,980 in women.[2]

Although CRC does not compromise intestinal absorption,[3] the nutritional status of the patient can be affected by hypermetabolism, which is a result of the tumor presence, chemoradiotherapy treatment, radical surgery and ostomy complications, especially in elderly patients.[4–6] However, with the end of adjuvant therapy, decreased physical activity after the ostomy and food monotony may result in an increase in the weight of these patients.[7,8] Thus, many have complications with ostomy,[8] which can affect the quality of life (QoL).

In addition to physical changes, after placement of a stoma, the patient undergoes emotional and social changes, such as self-esteem, body image and sexuality. This process has a large impact on the patient who needs to deal with difficulties such as stool odor, leakage of faeces, intestinal discomfort, diarrhea and wounds, which can generate socialization difficulties for this individual. In light of such adversities, the patient loses self-acceptance and has difficulty adapting to this new condition and reintegrating into social activities.[9]

To the best of our knowledge, only one study associated the nutritional status with the QoL in patients colostomized due to CRC.This study however was performed with only a small sample, therefore necessary that other studies carry out this association in order that it may contribute to the literature. Finally, several studies were found that associated the time of ostomy on QoL in the literature,[10–14] but few use the EORTC-QLQ-CR29 instrument, as this it is more recent and an update of the EORTC-QLQ-CR38 which is widely discussed in the literature. EORTC-QLQ-CR29 is a validated questionnaire for patients with CRC and should always be used with EORTC-QLQ-C30, a questionnaire for cancer patients. Considering that nutritional status and ostomy time are important in clinical practice, the aim of this study was to evaluate the influence of nutritional status and ostomy time on QoL in patients requiring ostomy for CRC.

Methods

Study design and ethical aspects

The present study was taken from a larger study. This cross-sectional study was conducted with all colostomized patients

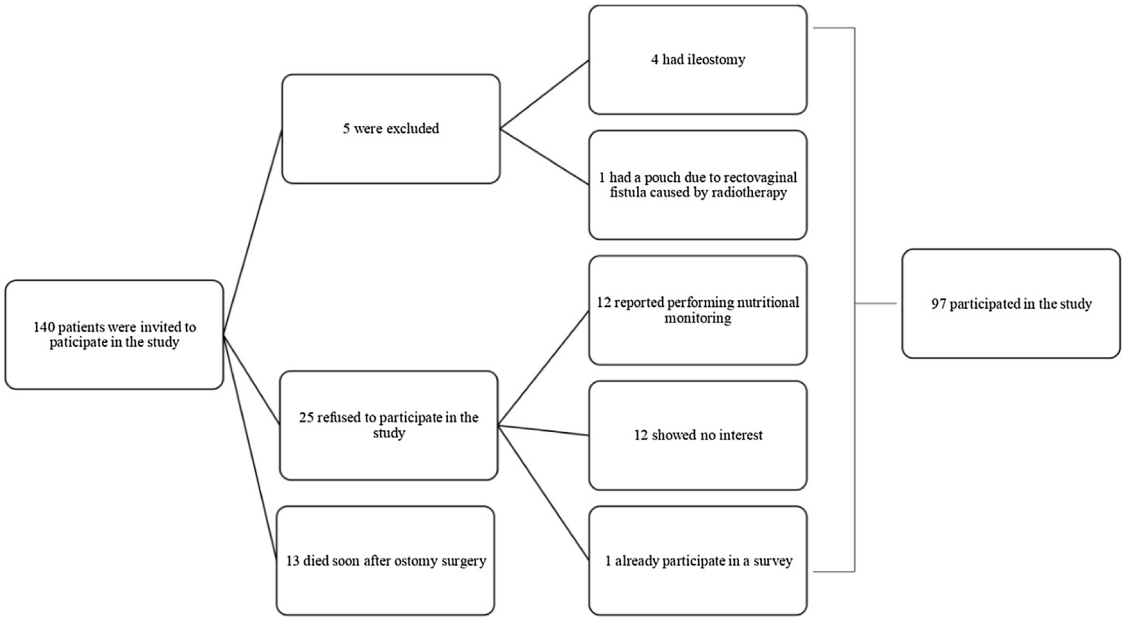

Fig. 1 – Flowchart of study.

due CRC aged 18 years or older, the resulting 97 individuals had attended a university hospital from August 2017 to May 2019. This study was approved by the Ethics Committee of the Federal University of Uberlândia (CAAE 65975817.6.0000.5152), and all participants signed a free and informed consent form.

Sample size

The sample was calculated considering the total number of individuals that were receiving follow up at the reference service at the hospital. The sample error of 5% was considered to calculate the first approximation of the sample size. Together with the population size, the sample size of 59 individuals was calculated.[15] Patients included and excluded from the research were described in Fig. 1.

Data collection

Clinic data were collected from medical records regarding the ostomy surgery, such as the diagnosis, resection and ostomy surgery dates and size of intestinal resection. Sociodemographic data, such as ethnicity, schooling and income were investigated. Weight and height were measured according to the World Health Organization (WHO) instructions. In order to calculate nutritional status, the BMI was calculated from body weight (kg) divided by the square of height (m), following WHO reference values for adults [kg/m^2 (<18.5 low weight; ≥ 18.5 to <25 eutrophic; ≥ 25 to 30 overweight, and 30 obesity)] and PAHO for the elderly [kg/m^2 (<23 low weight; ≥ 23 to <28 eutrophic; ≥ 28 to < 30, and ≥30 obesity)].[16,17]

Questionnaires authorized by the European Organization for Research and Treatment of Cancer (EORTC) to assess QoL, the EORTC-QLQ-C30 version 3.0 and EORTC-QLQ-CR29 were applied to the participants. The EORTC-QLQ-C30 version 3.0 is a questionnaire for cancer patients and consists of 30 questions, which are divided by scales: 6 of function (physical, emotional, cognitive, social, role performance, overall health and QoL); 3 of symptoms (fatigue, pain and nausea and vomiting); and 6 unique items (symptoms and financial impact of the disease). EORTC-QLQ-CR29 is a questionnaire for ostomized CRC patients, which contains 29 questions and should always be applied together with the EORTC-QLQ-C30. The EORTC-QLQ-C30 contains 4 scales (urinary frequency, blood and mucus in stool, stool frequency and body image) plus 19 unique items. All scores were calculated according to the EORTC-QLQ-C30 Scoring Manual, which contains summary information about supplementary modules.

Statistical analysis

The distribution of the variables was analyzed by Kolmogorov–Smirnov tests. The descriptive analysis was performed through mean and median (minimum–maximum) for quantitative variables and by proportion for qualitative variables. Statistical significance analysis was performed using the Wilcoxon's for quantitative variables and the chi–square test for qualitative variables. The Spearman's test was used to obtain the correlation coefficients. All data were analyzed in the Statistical System Software Package 20.0 for Windows (SPSS) and p-value ≤ 0.05 was considered statistically significant.

Results

Sociodemographic and clinical data of this study sample are shown on Tables 1 and 2. Of the 97 participating patients, there 50.5% were female, 64.9% were over 60 years old and 64.9% classified themselves as non-Caucasian. The sample showed lower education, as 56.7% had less than 9 years of study and 42.3% had an income of less than 2 minimum wages. More than 40% had a time of to diagnosis CRC less

Table 1 – Frequency of socioeconomic variables in colostomized patients due to colorectal cancer due to ostomy time and BMI.

Variables	Ostomy time (years)			P-value*	Nutritional status				P value*
	Total	<1 % (n)	≥1		Total	Malnourished	Well nourished % (n)	Overweight/ Obese	
Age (years)									
<60	35.1 (34)	35.4 (23)	34.4 (11)	0.922	33.7 (32)	13.0 (3)	31.9 (15)	56.0 (14)	0.007
≥60	64.9 (63)	64.6 (42)	65.6 (21)		63.3 (63)	87.0 (20)	68.1 (32)	44.0 (11)	
Gender									
Male	49.5 (48)	53.8 (35)	46.2 (30)	0.221	49.5 (47)	52.2 (12)	59.6 (28)	28.0 (7)	0.037
Female	50.5 (49)	46.2 (30)	59.4 (19)		50.5 (48)	47.8 (11)	40.4 (19)	72.0 (18)	
Ethnicity									
White	35.1 (34)	29.2 (19)	46.9 (15)	0.087	34.7 (33)	30.4 (7)	48.9 (23)	12.0 (3)	0.007
Not white	64.9 (63)	70.8 (46)	53.1 (17)		65.3 (62)	69.6 (16)	51.1 (24)	88.0 (22)	
Education (years)									
<9	56.7 (55)	52.3 (34)	65.6 (21)	0.227	57.9 (55)	56.5 (13)	55.3 (26)	64.0 (16)	0.539
9 to ≥12	20.6 (20)	26.2 (17)	9.4 (3)		18.9 (18)	21.7 (5)	17.0 (8)	20.0 (5)	
≤12	21.6 (21)	20.0 (13)	25.0 (8)		22.1 (21)	21.7 (5)	27.7 (13)	12.0 (3)	
Not specified	1.0 (1)	1.5 (1)	0.0 (0)		1.1 (1)	0.0 (0)	0.0 (0)	4.0 (1)	
Monthly Minimum Wage*									
<1	12.4 (12)	7.7 (5)	21.7 (7)	0.129	12.6 (12)	8.7 (2)	14.9 (7)	12.0 (3)	0.461
≥1 to <2	29.9 (29)	27.7 (18)	34.4 (11)		29.5 (28)	39.1 (9)	27.7 (13)	24.0 (6)	
≥2 to <3	23.7 (23)	27.7 (18)	15.6 (5)		23.2 (22)	26.1 (6)	25.5 (12)	16.0 (4)	
≥3	29.9 (29)	30.8 (20)	28.1 (9)		30.5 (29)	26.1 (6)	29.8 (14)	36.0 (9)	
Not specified	4.1 (4)	6.2 (4)	0.0 (0)		4.2 (4)	0.0 (0)	2.1 (1)	12.0 (3)	

* 1 Monthly Minimum Wage was equivalent to US$312.00. *Chi–Square test.

Table 2 – Frequency of clinical variables in colostomized patients due to colorectal cancer due to ostomy time and BMI.

Variables	Ostomy time (years)			P-value*	Nutritional status				P value*
	Total	<1 % (n)	≥1		Total	Malnourished	Well nourished % (n)	Overweight/ Obese	
Diagnostic time (months)									
<12	47.4 (46)	70.8 (46)	0.0 (0)	**<0.001**	47.4 (45)	52.2 (12)	48.9 (23)	40.0 (10)	0.250
≥12 to <24	20.6 (20)	16.9 (11)	28.1 (9)		20.0 (19)	17.4 (4)	19.1 (9)	24.0 (6)	
≥24	29.9 (29)	9.2 (6)	71.9 (23)		30.5 (29)	21.7 (5)	31.9 (15)	36.0 (9)	
Not specified	2.1 (2)	3.1 (2)	0.0 (0)		2.1 (2)	8.7 (2)	0.0 (0)	0.0 (0)	
Tumor location									
Rectal	67.0 (65)	66.2 (43)	68.8 (22)	0.304	66.3 (63)	65.2 (15)	61.7 (29)	76.0 (19)	0.789
Colon	22.2 (22)	26.2 (17)	15.6 (5)		23.2 (22)	26.1 (6)	25.5 (12)	16.0 (4)	
Not specified	10.3 (10)	7.7 (5)	15.6 (5)		10.5 (10)	8.7 (2)	12.8 (6)	8.0 (2)	
Staging									
I	12.4 (12)	16.9 (11)	3.1 (1)	**0.007**	12.6 (12)	8.7 (2)	10.6 (5)	20.0 (5)	0.572
II	26.8 (26)	21.5 (14)	37.5 (12)		27.4 (26)	17.4 (4)	31.9 (15)	28.0 (7)	
III	25.8 (25)	27.7 (18)	21.9 (7)		25.3 (24)	34.8 (8)	21.3 (10)	24.0 (6)	
IV	5.2 (5)	7.7 (5)	0.0 (0)		5.3 (5)	8.7 (2)	6.4 (3)	0.0 (0)	
Pathological stage Y	10.3 (10)	13.8 (9)	3.1 (3)		10.5 (10)	17.4 (4)	10.6 (5)	4.0 (1)	
Not specified or unknown	19.6 (19)	12.3 (8)	34.4 (11)		18.9 (19)	13.0 (3)	19.1 (9)	4.0 (6)	
Comorbidities									
No	41.2 (40)	46.2 (30)	31.3 (10)	0.229	40.0 (38)	56.5 (13)	29.8 (14)	44.0 (11)	0.259
1	34.0 (33)	33.8 (22)	34.4 (11)		34.7 (33)	26.1 (6)	42.6 (20)	28.0 (7)	
2 or more	24.7 (24)	20.0 (13)	34.4 (11)		25.3 (24)	17.4 (4)	27.7 (13)	28.0 (7)	
Ostomy time (years)									
<1	—	—	—	—	67.4 (67)	78.3 (18)	70.2 (33)	52.0 (13)	0.129
≥1	—	—	—		32.6 (31)	21.7 (5)	29.8 (14)	48.0 (12)	
BMI									
Malnourished	24.2 (23)	28.1 (18)	16.1 (5)	0.156	—	—	—	—	—
Eutrophic	49.5 (47)	51.6 (33)	45.2 (14)		—	—	—	—	
Overweight	17.9 (17)	15.6 (10)	22.6 (7)		—	—	—	—	
Obese	8.4 (8)	4.7 (3)	16.1 (5)						

* Chi–Square test.

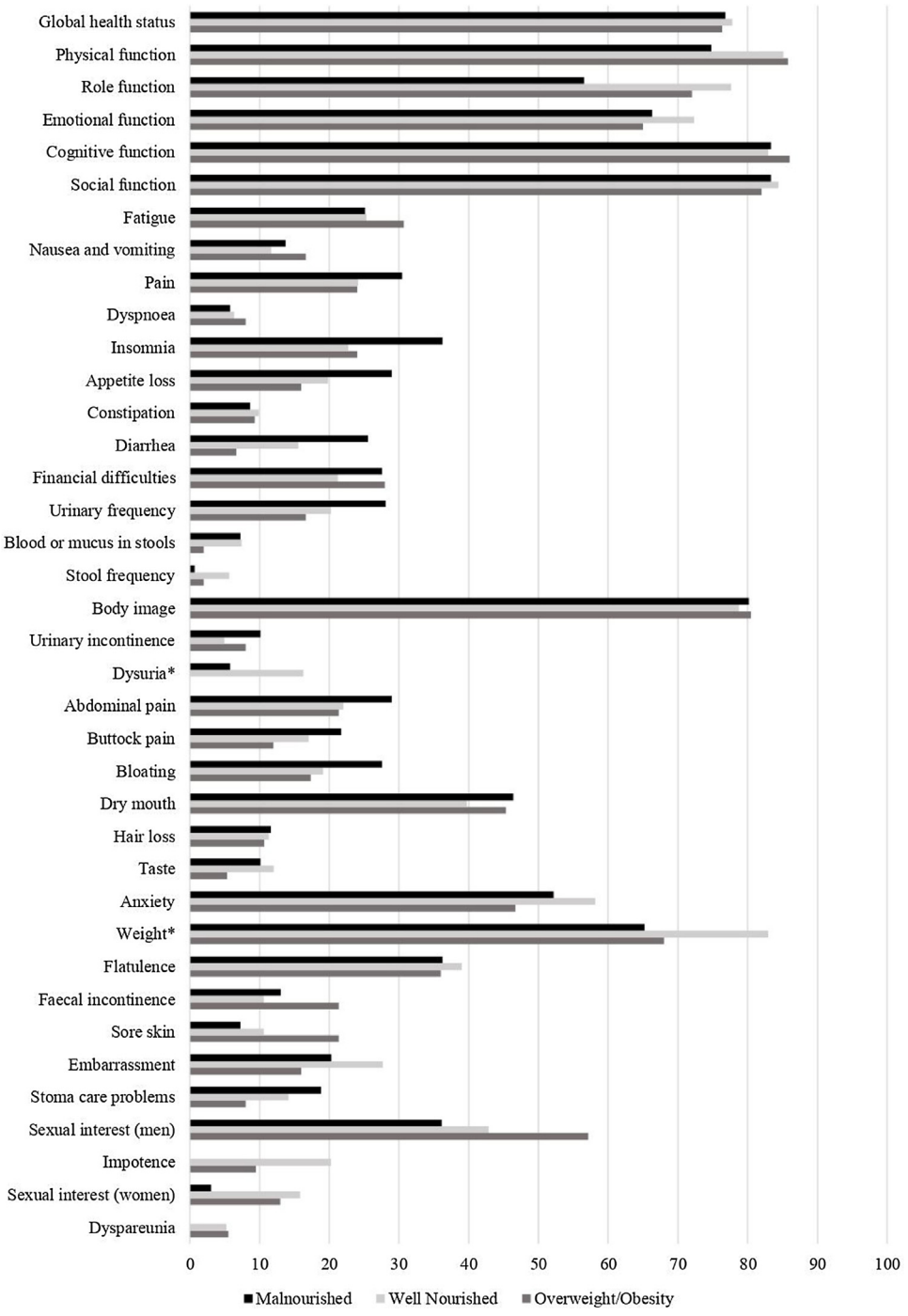

Fig. 2 – Mean of the EORTC QLQ-C30 and EORTC QLQ-CR29 quality of life scores across domains in colostomized patients by ostomy time.*Wilcoxon's test; p-value ≤ 0.05.

than 12 months, and 67.4% had an ostomy time that was also less than 12 months. Regarding stage, 26.8% and 25.8% patients were in stage II and III, respectively. Systemic arterial hypertension and diabetes were frequent comorbidities, 36.1% and 23.7%, respectively. Finally, 24.2% were malnourished, and 26.3% were considered overweight or obese.

There was found association between the longer time to diagnosis and the ostomy time, as expected. Older adults (87%) and non-Caucasian (69.6%) showed more malnutrition. Overweight or obese were more frequently found in women participations. All patients with metastasis had an ostomy time of less than 12 months. There were no statistically significant differences for the other variables.

Considering the QoL (EORTC-QLQ-CR30) (Figs. 2 and 3), a significant difference was found in role function, with the worst score in patients colostomized for a shorter time (<12 months). When considering domains of EORTC-QLQ-CR29, also individuals colostomized for a shorter time had more

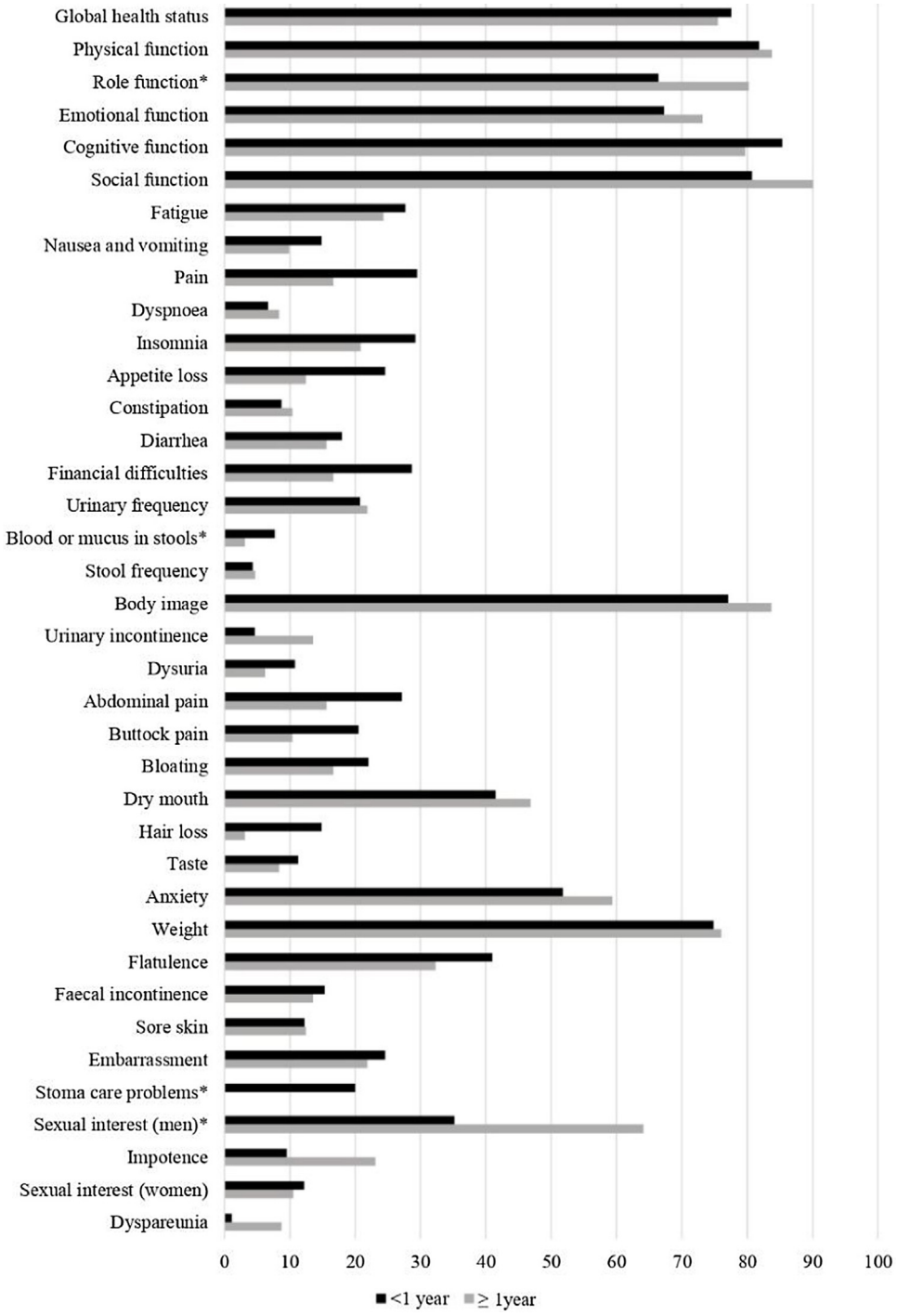

Fig. 3 – Mean of the EORTC QLQ-C30 and EORTC QLQ-CR29 quality of life scores across domains in colostomized patients by nutrition status.*Wilcoxon's test; p-value ≤ 0.05.

blood or mucus in stools, stoma care problems and less men's sexual interest. In addition, concern about weight was associated with nutritional status, affecting the malnourished patients, as was expected.

Ostomy time correlated positively with role function and men's sexual interest (Tables 3 and 4). On the other hand, ostomy time was correlated negatively with insomnia, appetite loss, dysuria, abdominal pain, buttock pain, bloating, hair loss, taste loss and stoma care problems. BMI correlated positively with impotence and the longer BMI lower buttock pain and taste loss.

Discussion

In the present study, shorter ostomy time and malnutrition influenced the QoL in patients with CRC. Shorter ostomy time (<1 year) was associated with role function, blood or

Table 3 – Correlation of ostomy time and BMI with the scales of EORTC QLQ-C30 quality of life scores of patients with colorectal cancer.

	Ostomy duration (years)		Nutritional status	
Scale	R*	P value	R*	P value
Global quality of life	−0.004	0.967	0.017	0.867
Physical function	0.084	1.000	0.170	0.100
Role function	0.280	**0.005**	0.130	0.208
Emotional function	0.112	0.274	0.067	0.519
Cognitive function	−0.178	0.081	−0.28	0.790
Social function	0.065	0.526	0.091	0.381
Pain	−0.230	**0.023**	−0.028	0.791
Fatigue	−0.188	0.065	0.037	0.721
Nausea and vomiting	−0.152	0.138	−0.050	0.629
Dyspnea	−0.010	0.921	0.155	0.135
Insomnia	−0.209	**0.040**	−0.176	0.088
Appetite	−0.258	**0.011**	−0.167	0.105
Constipation	−0.005	0.961	0.045	0.665
Diarrhea	0.080	0.435	−0.201	0.051
Financial difficulties	−0.123	0.230	−0.035	0.733

* Spearman Correlation coefficient.

Table 4 – Correlation of ostomy time and BMI with the scales of EORTC QLQ-CR29 quality of life scores of patients with colorectal cancer.

	Ostomy time (years)		Nutritional status	
Scale	R*	P value	R*	P value
Urinary frequency	−0.085	0.406	−0.079	0.447
Blood or mucus in stools	−0.217	**0.033**	−0.153	0.138
Stool frequency	−0.030	0.770	0.108	0.296
Body image	0.042	0.684	0.019	0.857
Urinary incontinence	0.193	0.058	−0.011	0.916
Dysuria	−0.238	**0.019**	−0.176	0.087
Abdominal pain	−0.275	**0.006**	−0.148	0.153
Buttock pain	−0.223	**0.028**	−0.220	**0.032**
Bloating	−0.228	**0.025**	−0.164	0.113
Dry mouth	−0.081	0.431	0.006	0.956
Hair loss	−0.267	**0.008**	−0.054	0.605
Taste	−0.217	**0.033**	−0.241	**0.019**
Anxiety	−0.063	0.541	0.050	0.628
Weight	0.093	0.366	0.151	0.144
Flatulence	−0.092	0.370	0.014	0.896
Fecal incontinence	−0.094	0.359	−0.022	0.830
Sore skin	0.053	0.603	0.150	0.147
Embarrassment	−0.076	0.457	0.032	0.761
Stoma care problems	−0.463	**<0.001**	−0.172	0.096
Sexual interest (men)	0.441	**0.002**	0.254	0.085
Impotence	0.271	0.062	0.384	**0.008**
Sexual interest (women)	0.012	0.935	−0.122	0.410
Dyspareunia	0.240	0.097	−0.017	0.907

* Spearman Correlation coefficient.

mucus in stools, stoma care problems and men's sexual interest. Malnutrition was associated with concern about weight. There are studies that evaluate nutritional status and QoL in patients colostomized due to CRC; however, these generally make separate evaluations with just QoL and do make any association withthe ostomy time[12] or evaluated several reasons for ostomies[10] or considered colostomy and ileostomy together,[14] while other studies use different methods to assess QoL.[11,13] In addition, there are few results similar to those of the present study. No studies were found that compare ostomy time and nutritional status with QoL by use of the EORTC-QLQ-CR29 instrument.

Regarding role function, low scores in patients with shorter ostomy time may be due to surgery and adaptation to daily activities.[18] In addition, a study showed that patients undergoing adjuvant therapy had lower role function scores.[19] Therefore, to gain knowledge concerning the physical changes caused by the ostomy, the health team needs to assist ostomized patients in the rehabilitation process in order to improve their QoL as quickly as possible.[20] Surgery and

chemoradiotherapy treatment may cause bowel changes, among which blood or mucus in stools may be presents.[21]

Stoma care problems occurred as expected, appearing in patients with a shorter ostomy time, a fact that can be explained by the period necessary for adaptation to the device. The ostomy represents a change in intestinal physiology, thereby the patient needs professional guidance aimed beyond the transfer of knowledge, rehabilitation and integration of the family in care[22] which goes on to provide an improved QoL for the patient.[23]

Lower male sexual interest in the shorter ostomy time was expected due to the recent procedure performed, where the decreased interest may be due to psychological disorders after surgery, erectile dysfunction or fear of suffering prejudice from their partner.[24] However, men generally talk less about sexuality out of shame, so information may not represent reality.[25]

The concern about weight can arise through weight loss due to the disease and the fear of not recovering from it.[26] The evolution of the disease and the decrease of food intake causes the weight lossin cancer patients, which may have a self-perceptive distortion on weight, both an overestimate and underestimate.[27] A study that evaluated the body image of patients with gastrointestinal cancer showed that patients with colon and sigmoid tumors tend to overestimate body size.[27]

In the present study, more than half of the sample showed a nutritional deviance, 24.2% were malnourished and almost 30% were overweight or obese according to BMI. Nutritional deviations frequency found consolidate the studies comprising of patients with CRC, but without ostomy. Overweightness is most frequently found in studies ranging from 6% to 42.4% of overweight or obesity.[22,28,29] On the other hand, malnutrition frequency is lower, varying from 4% to 7.6%.[22,28,29] A study was found with colostomized CRC patients, of which 15% were malnourished and 20% were overweight or obese.[3] Obesity is not ideal for patients with CRC, however being overweight seems to contribute to better survival for this patient compared to malnutrition.[30]

Regarding the correlation between BMI and QoL in the present study, the higher the BMI, the worse the impotence and the better buttock pain and taste loss. While in a similar study, the higher the BMI, the worse the physical domain.[3] There is a lack of studies that associate the nutritional status of patients colostomized by CRC with QoL, however studies with patients without ostomies show that QoL is better in those with higher BMI.[31,32] It is of the utmost important to monitor the nutritional status of the patient throughout the treatment of CRC. In order that malnutrition during chemoradiotherapy and surgery, as well as becoming during adapting to the ostomy are all avoided.

Limitations

There were some limitations associated with the present study. First, it is a cross-sectional study, so it does not give a cause and effect relationship. Another factor is the different ostomy times between patients, however, to minimize these differences, patients were categorized into two groups, up to one year and another over one year. In addition, we use only BMI to assess nutritional status, other parameters can be used in further research. Other study suggestions are to follow these patients longer in a prospective study and to correlate food intake with QoL and nutritional status, in a sense so as to make adjustments for other confounding variables.

Conclusion

Ostomy time and nutrition deviations were both associated with QoL in colostomized patients CRC. Ostomy time was associated with role function, insomnia, appetite loss, dysuria, abdominal pain, buttock pain, bloating, hair loss, taste loss, stoma care problems and men's sexual interest. Higher the BMI the better buttock pain, taste loss and the worse impotence. High frequency of nutritional deviations shows the need for nutritional individualized care for colostomized patients due to CRC.

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Conflict of interest

The authors declare no conflicts of interest.

Availability of data and material

The data that supports the findings of this study are available from the corresponding author, upon reasonable request.

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