Quality of Life of Patients After Colorectal Cancer Surgery in Soba University Hospital, Sudan: A Cross-Sectional Study

Mohammed A. Adam (dr.mohammed.a.adam@gmail.com)
MBBS, University of Khartoum. Audit Director at Soba Center for Audit and Research
Alaa A. Salih
MBBS, University of Khartoum
Abubaker E.A Koko
MBBS, University of Khartoum
Sami Altalib
MBBS, University of Khartoum. Department of Community Medicine
Ali Yasen Yasen MohamedAhmed
Sandwell & West Birmingham Hospitals NHS Trust
Elfatih A. Hasabo
University of Khartoum, Faculty of Medicine
Ghassan E. Ahmed
University of Khartoum, Faculty of Medicine
Mohammed Khalid Abdalla Maroof
University of Khartoum, Faculty of Medicine
Omer El Faroug H Salim
Associate professor Faculty of Medicine - University of Khartoum, Soba Teaching Hospital FRCS, MD, Khartoum

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Abstract

Background: Colorectal surgery is reported to have significant effects on patients, both physically and psychologically. On other hand, infections are found to be a major risk factor in Sudan and Sub-Saharan Africa such as intestinal Schistosoma colitis, especially those presenting with sigmoid colonic adenocarcinoma.

Aim of the study: To assess the quality of life of patients after colorectal cancer surgery and the effect of the stoma on their life.

Methods: A descriptive cross-sectional hospital-based study was done at Soba University Hospital. A sample of 72 patients with colorectal cancer who had undergone colorectal surgery was fully covered and interviewed using the SF-36 Quality of life standard questionnaire.

Results: The total sample was 72 with a mean age of 51.1 ± 14.6 years. 79% were married, 70% were working, with free business being the most encountered occupation (36.1%). However, only 48.6% were still employed at the time of surgery. Regarding the mental health component, there was a significant difference in social functioning domain mean scores between patients who were employed and unemployed patients. Where the physical functioning and role physical domains were found to differ significantly with the different educational attainment of patients. Patients who did not undergo radiation therapy reported higher mean scores of role limitation due to physical problems, compared to patients who received radiation therapy.

Conclusion: Our result found the quality of life was affected negatively in terms of the level of pain and presence of colostomy with sexual activity affection but the other parameters were not strongly affected.

Introduction

Colorectal cancer is considered the third most common cause of cancer mortality estimated at 2006 in the United States and the leading cause of death in both more and less economically developed countries, and even in patients who underwent resection, more than half of them get a recurrence of the disease (1,2).

Patients with multiple serrated polyps have a higher risk for developing colorectal cancer, studies showed the significant linkage between lifestyle behaviors such as cigarette smoking, poor diet physical activities, and neutrinos estimated to be responsible for 30% -50% of the incidence of colorectal cancer(1,3,4).

On the other hand, infections are found to be major risk factors in Sudan and Sub-Saharan Africa such as intestinal Schistosoma colitis, especially those presenting with sigmoid colonic adenocarcinoma (8). Many epidemiological studies estimate the risk of colorectal cancer in individuals with family history (5). A Lot of studies suggest that sunlight may protect against colon cancer in proportion to vitamin D in the blood as protective factors (3). Studies on the disease outcome such as death or hospital admission are concerned about palliative or curative care that has its effect on the social life of the patients (6).

Recently, the importing of colorectal screening worldwide, which includes fecal occult blood testing and endoscopy procedures (sigmoidoscopy and colonoscopy), has had an impact on early disease detection that has led to a significant ongoing reduction in both the incidence of and mortality from, colorectal carcinoma(4).

In the treatment of early colorectal cancer, the extent of surgery has always been an issue of reserving the problem. It has been reported that stoma associated with colorectal cancer surgery is associated with a significant degree of psychological morbidity.

Most of the information regarding the impacts of different types of surgery on the quality of life of colorectal cancer patients originates from research in Western countries. Due to the lack of comparable studies in Oriental patients, it is difficult to know whether similar conclusions can be drawn across cultural boundaries. Worldwide, 1.2 million new colorectal cancer cases and 609,000 deaths were expected to occur in 2008 (6). A rapid increase in colorectal cancer incidence has been observed in developing countries where the occurrence formerly was low. On the other hand, Sudan has no national population-based cancer registry. The main sources of cancer data are the hospital-based case series at the only two oncological centers in the country, both located in the densely populated Central Sudan, i.e., the Radiation and Isotope Center in Khartoum (RICK), Khartoum State, and the National Cancer Institute of the University of Gezira (NCI-UG) in Wad Medani (8). We aimed to measure the impact of

colorectal cancer surgery and the presence of the stoma on various aspects of the quality of life of Sudanese patients suffering from colorectal cancer which is a major contributor to the cancer burden worldwide.

Methodology

Design and participants

A cross-sectional study was conducted at Soba University Hospital in Khartoum state, Sudan between 2015 -2018 to assess the quality of life for patients who underwent surgery for colorectal cancer. We included all living patients who underwent colorectal cancer surgery at Soba University Hospital from 2015 to 2018. We excluded all newly diagnosed patients who didn't undergo colorectal cancer surgery.

Ethical approval

Formal informed consent was taken from all the respondents and the study was approved by Soba Centre for Audit and Research, Khartoum, Sudan.

Questionnaire and data collection

After the surgery, demographic and clinical data were collected from included participants. Quality of life was assessed via interview using the 36-item Short Form (SF-36) survey which contains the following domains: physical functioning, role limitations due to physical health, emotional problems, energy/fatigue, emotional well-being, social functioning, pain, and general health. The scores for each domain range from 0 to 100. We used the Arabic version of SF-36(7).

Statistical analysis plan:

Data were analyzed using R software version 4.0.2. Descriptive statistics were performed for patients' data and quality of life scores. Categorical data were presented as frequencies and percentages, while continuous data such as age and quality of life scores were reported as mean ± standard deviation (SD). Finally, non-parametric tests such as the Mann-Whitney test (Wilcoxon Rank Sum Test) were used to explore differences in quality of life scores among groups.

Results

Patients' information

The study included 72 patients, with a mean age of 51.1 ± 14.6 ranging from 25 to 73 years. Half of the patients did not receive any formal education (illiterate 20.8%, and khalwa 29.2%), and those who received primary schooling constituted 30.6%. The majority were married (69.4%), and over 70% were working, with free business being the most encountered occupation (36.1%). However, only 48.6% were still employed at the time of surgery. Over half of patients (56.9%) were diagnosed with rectal cancer, and 43.1% were diagnosed with colonic cancer. Table 1 shows details of patients' characteristics.

Mental Health components

Mean scores of mental health component summary ranged from 72.4 ± 23 to 49.5 ± 11.9 for social functioning, and emotional wellbeing, respectively. Patients who underwent radiation reported mean scores of 69.8 ± 24.6 and 50.29 ± 10.02, for emotional well-being and social functioning, respectively Table 2. Regarding social functioning, patients with rectal cancer reported a mean score of 50.30 ± 11.69, in contrast to those with colon cancer who reported 48.39 ± 12.39, while the mean score of emotional well-being was for rectal cancer patients and colon cancer patients 72.5 ± 25.8 and 72.4 ± 19.7, respectively. The emotional-wellbeing mean score for patients who underwent colostomy was 70.0 ± 25.8, while the social functioning means the score was 48.78 ± 12.12 Table 3.

Regarding complications, patients with stoma complications reported emotional well-being mean score of 70.4 ± 26.2, while those with sexual complications and urinary complications reported a mean score of 73.1 ± 21.5 and 67.5 ± 23.2, respectively. In

terms of social functioning, the mean scores were as follows: 47.64 ± 12.09 for patients with stoma complications, 48.16 ± 12.74 for patients with sexual complications, and 50.57 ± 9.82 for those with urinary complications. The mean score of role limitations due to emotional problems among patients with stoma complications was 69.37 ± 35.47, while those with sexual complications and urinary complications reported a mean score of 73.53 ± 30.46 and 62.12 ± 29.63, respectively Table 4.

Physical health components

Mean scores of physical health component summary were 74.0 ± 24.6. For physical functioning, 60.5 ± 16.1 for general health, 59.4 ± 38.8 for role limitation due to physical problems, role limitations due to emotional problems 70.8 ± 31.1, 61.8 ± 25.7 for pain, and 60.2 ± 30.0 for energy/fatigue Table 2.

Regarding physical function score, a statistically significant higher score was found in patients who didn't receive colostomy ($p < 0.001$) and didn't manifest any stoma ($p < 0.001$) or sexual complications ($p = 0.02$)

Regarding score for role limitations due to physical health, a statistically significant difference in score was found higher in patients with colon cancer than patients with rectal cancer ($p = 0.035$), who didn't receive radiation ($p = 0.004$), didn't receive colostomy ($p = 0.002$) and didn't manifest any stoma complications ($p < 0.001$)

Regarding pain score, the score was statistically significant and higher in patients with colon cancer than rectal cancer ($p = 0.009$), and in patients who didn't show any stoma complication ($P = 0.013$).

The mean score of physical functioning among rectal cancer patients was found to be 72.1 ± 22.9, in contrast to those with a colonic cancer diagnosis with a mean score of 76.6 ± 26.8. Among those who underwent radiation, the mean score was found to be 71.0 ± 26.0, while those who underwent chemotherapy were 73.6 ± 25.2 Table 3.

Considering complications, physical functioning mean scores were as follows: 58.0 ± 22.7 for patients with stoma complications, 66.9 ± 24.9 for patients with sexual complications, and 68.6 ± 23.1 for those with urinary complications. The mean score of role limitations due to physical health among patients with stoma complications was 40.54 ± 39.24, while those with sexual complications and urinary complications reported a mean score of 61.03 ± 38.03 and 61.36 ± 37.58, respectively Table 4.

Discussion

The study investigated the quality of life of patients following surgical operations for colorectal cancer in Soba University Hospital. The study showed that several patients lost their jobs after the operation due to physical limitations, besides the ones who were already unemployed even before undergoing the operation either because of the disease limitation or other reasons. Most of the patients reported an improvement in their general health compared to a year ago. Among the patients who have a stoma, a few of them experienced complications such as prolapse, retraction, and skin induration and while the majority reported no complications. All scales are higher in patients with no stoma comparing the patients who have a stoma.

Some of the patients experienced sexual complications such as impotence and retrograde ejaculation, another group experienced urinary complications such as dysuria and hematuria. Among different components, the social functions are the most affected when compared to the rest of the components with the physical functions being the least affected, and this comes in agreement with the study conducted in the District of Modena where patients work activity, physical activity, and diet remained virtually unchanged 5 years after the diagnosis of the tumor (8), and in contrast with the prospective follow-up study conducted in Denmark where a decrease in the SF-36 physical component score was reported (9) and lower than that reported by Dilek et al. in 2020 (10). Social functions themselves showed a difference between employed and unemployed patients, with the employed having more social functions. The mental health components showed some differences when compared between patients who have undergone the different types of operations. Physical functioning and role physical domain showed variations according to educational level, with primary school being the lowest and secondary school being the highest. Regarding the physical role and bodily pain, housewives and laborer reported the lowest, while employed reported the highest.

Physical functioning among rectal cancer patients was found to be lower than in those with colonic cancer diagnoses. However, for those who underwent chemotherapy, the mean score was found to be higher than in those who underwent radiation.

Role limitations due to physical problems are reported more among colonic cancer surgery than rectal cancer surgery. Also, patients who did not undergo radiation therapy reported high role limitations due to physical problems compared to have received them. There are differences in role limitations due to physical problems when compared against the type of surgery, with AR being the highest than APR, and hemicolectomy being the lowest. Patients with stoma complications reported the least physical component, as well as role limitation, mean scores.

The emotional well-being score among rectal cancer patients was found to be lower than those with a colonic cancer diagnosis. However, for those who underwent a colostomy, the mean score was found to be higher than in those who underwent radiation.

Regarding complications, patients with stoma complications reported emotional well-being mean score lower than those with sexual complications

No associations were found between quality of life with its different components from one side and gender, age, level of education, marital status, occupation, diagnosis, or type of operation from another side, and this could be due to the standard of living and the high satisfaction level amount Sudanese patients.

Assessing the impact of colorectal Surgery on the quality of life for patients with colorectal cancer at Soba University Hospital gave reliable data on the affection of Sudanese Patients by this primary surgery and the prognosis.

Measuring the relation between the patients' quality of life and their demographic data allows planners to make policies and interventions to ensure the quality of life of these patients is not being affected after the operation.

Conclusion

Our result found the quality of life was affected negatively in terms of the level of pain and presence of colostomy with sexual activity affection but the other parameters were not strongly affected. This is mostly due the high level of satisfaction in Sudanese and specially those strongly believers in Islamic religion.

Declaration

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Ethics approval and consent to participate: Ethical approval of this study was obtained from the Soba Center for Audit and research, University of Khartoum, Khartoum, Sudan. The study was carried out following the relevant ethical guidelines and regulations. All the participants provided informed consent.

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Authors' contribution:

MAA: Idea of the study, collect data, drafting, and submitting the manuscript. **AAS:** contribute to the concept, data collection, and writing draft. **ST**: data interpretation and manuscript drafting. **AEAK:** analysis plan, data analysis and interpretation, and writing

manuscript. **EAH:** analysis plan, data analysis and interpretation, writing manuscript, and drafting the article. **GAH:** design the study, acquisition of data, and writing draft. **MKAM:** design the study, acquisition of data, and writing draft. **AYYM:** data analysis plan, critical review and draft writing. **OEHS:** Idea generation, critical review and final drafting. All authors revised the manuscript and approved it for publication.

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Tables

Table 1: baseline characteristics for patients with colorectal cancer. (n = 72)

Variables	**Overall**, N = 72[1]
Age	51.1 ± 14.6
Educational Level	
Illiterate	15 (20.8%)
Khalwa	21 (29.2%)
Primary School	22 (30.6%)
Secondary School	13 (18.1%)
University	1 (1.4%)
Marital Status	
Divorced	6 (8.3%)
Married	50 (69.4%)
Single	15 (20.8%)
Widowed	1 (1.4%)
Occupation	
Employee	13 (18.1%)
Free Business	26 (36.1%)
Housewife	21 (29.2%)
Labour	12 (16.7%)
Employment Status	
Employed	35 (48.6%)
Unemployed	37 (51.4%)
diagnosis	
Colonic Cancer	31 (43.1%)
Rectal Cancer	41 (56.9%)
Radiation (Yes)	43 (59.7%)
Chemotherapy (Yes)	61 (84.7%)
Operation Method	
APR	23 (31.9%)
AR	33 (45.8%)
Hemicolectomy	16 (22.2%)
Colostomy (Yes)	41 (56.9%)
Stoma Complications	
no complication	35 (48.6%)
Prolapse	12 (16.7%)
Retraction	8 (11.1%)

Skin indurationxzfx	17 (23.6%)
Stoma complications (Yes)	37 (51.4%)
Sexual Complications	
Impotence	21 (29.2%)
no complication	38 (52.8%)
Retrograde ejaculation	13 (18.1%)
Sexual complications (Yes)	34 (47.2%)
Urinary Complications	
Dysuria	10 (13.9%)
Hematuria	12 (16.7%)
No complication	50 (69.4%)
Urinary complications (Yes)	22 (30.6%)

[1] Statistics presented: Mean ± SD; n (%)

Table 2: Overall Quality of life for patients with colorectal cancer. (n = 72)

Variables	Overall
General health	60.5 ± 16.1
Physical functioning	74.0 ± 24.6
Role limitations due to physical health	59.4 ± 38.8
Role limitations due to emotional problems	70.8 ± 31.1
Pain	61.8 ± 25.7
Energy/fatigue	60.2 ± 30.0
Emotional well-being	72.4 ± 23.2
Social functioning	49.5 ± 11.9

Statistics presented: Mean ± SD

Table 3: Quality of life categorized according to type of therapy, diagnosis and presence of colostomy for patients with colorectal cancer. (n = 72)

Variables	Diagnosis		p-value	Radiation		p-value	Chemotherapy		p-value	Colostomy		p-value
	Rectal	Colon		Yes	No		Yes	No		Yes	No	
General health	58.9 ± 16.1	62.6 ± 16.1	0.507	58.3 ± 16.3	63.8 ± 15.5	0.195	61.1 ± 16.0	56.8 ± 17.4	0.421	58.9 ± 17.5	62.6 ± 14.1	0.797
Physical functioning	72.1 ± 22.9	76.6 ± 26.8	0.183	71.0 ± 26.0	78.4 ± 22.1	0.274	73.6 ± 25.2	76.4 ± 21.9	0.88	60.5 ± 23.6	91.9 ± 10.2	**<0.001**
Role limitations due to physical health	50 ± 41.83	71.77 ± 30.78	**0.035**	50 ± 37.4	73.28 ± 37.16	**0.004**	59.02 ± 39.8	61.36 ± 34.21	0.91	46.95 ± 40	75.81 ± 30.61	**0.002**
Role limitations due to emotional problems	69.92 ± 34	72.04 ± 27.35	0.942	65.12 ± 32.49	79.31 ± 27.33	0.051	72.13 ± 31.14	63.64 ± 31.46	0.327	68.29 ± 34.92	74.19 ± 25.4	0.715
Pain	55.4 ± 22.8	70.2 ± 27.1	**0.009**	59.5 ± 26.9	65.1 ± 23.7	0.22	62.8 ± 25.7	56.1 ± 25.8	0.506	56.9 ± 25.7	68.2 ± 24.5	0.084
Energy/fatigue	65.12 ± 30.81	53.71 ± 28.17	0.072	56.86 ± 30.02	65.17 ± 29.9	0.372	62.30 ± 30.52	48.64 ± 25.41	0.15	57.44 ± 32.69	63.87 ± 26.2	0.355
Emotional well-being	72.5 ± 25.8	72.4 ± 19.7	0.609	69.8 ± 24.6	76.4 ± 20.7	0.381	73.4 ± 23.7	67.3 ± 21.0	0.215	70.0 ± 25.8	75.6 ± 19.3	0.346
Social functioning	50.30 ± 11.69	48.39 ± 12.39	0.444	50.29 ± 10.02	48.28 ± 14.46	0.871	50 ± 10.94	46.59 ± 16.85	0.696	48.78 ± 12.12	50.4 ± 11.85	0.485

Statistics presented: Mean ± SD

Statistical tests performed: Wilcoxon rank-sum test

Table 4: Quality of life categorized according to the presence of complication for patients with colorectal cancer. (n = 72)

Variables	Stoma complications		p-value	Sexual complications		p-value	Urinary complications complications		p-value
	Yes	No		Yes	No		Yes	No	
General health	58.4 ± 18.3	62.7 ± 13.3	0.658	60.9 ± 14.6	60.1 ± 17.5	0.878	58.4 ± 13.0	61.4 ± 17.4	0.241
Physical functioning	58.0 ± 22.7	91.0 ± 11.7	**<0.001**	66.9 ± 24.9	80.4 ± 22.8	**0.02**	68.6 ± 23.1	76.4 ± 25.1	0.088
Role limitations due to physical health	40.54 ± 39.24	79.29 ± 26.77	**<0.001**	61.03 ± 38.03	57.89 ± 39.89	0.811	61.36 ± 37.58	58.5 ± 39.64	0.874
Role limitations due to emotional problems	69.37 ± 35.47	72.38 ± 26.18	0.928	73.53 ± 30.46	68.42 ± 31.9	0.469	62.12 ± 29.63	74.67 ± 31.27	0.057
Pain	54.6 ± 24.6	69.4 ± 24.8	**0.013**	60.0 ± 24.5	63.4 ± 26.9	0.616	61.6 ± 24.6	61.9 ± 26.4	0.97
Energy/fatigue	56.49 ± 33.62	64.14 ± 25.62	0.233	58.38 ± 29.94	61.84 ± 30.43	0.626	52.05 ± 27.24	63.8 ± 30.77	0.17
Emotional well-being	70.4 ± 26.2	74.6 ± 19.8	0.463	73.1 ± 21.5	71.9 ± 25.0	0.896	67.5 ± 23.2	74.6 ± 23.1	0.272
Social functioning	47.64 ± 12.09	51.43 ± 11.65	0.122	48.16 ± 12.74	50.66 ± 11.24	0.385	50.57 ± 9.82	49 ± 12.84	0.873

Statistics presented: Mean ± SD

Statistical tests performed: Wilcoxon rank-sum test