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Health Related Quality of Life among Patients with Colorectal Cancer in Erbil, Iraq

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Abstract

Background and Objectives: Colorectal cancer (CRC) is one of the most common cancers worldwide and has a big impact on patients' daily lives and quality of life. This study aims to assess health related quality of life domains among patients with colorectal cancer and to identify predictors, which interfere with the patient's quality life and its associations with sociodemographic of participants.

Methods: A descriptive cross-sectional study design was carried out from May to September 2025 in Erbil city on 140 patients, which affected with colorectal cancer. Data were collected using sociodemographic data form, European Organization for Research and Treatment of Cancer questionnaires EROTC QLQ-C30 for general cancer quality life, and the QLQ-CR29, specific for colorectal symptoms. Data were analyzed with SPSS version 25, using descriptive and inferential statistics.

Results: (32.9%) of study sample were in age group more than 60 years old, while more than half of participants were men (58.6%) and most were married (82.9%), illiterate (23.6%) and living in urban areas were (87.1%). The mean score of global health status was 47.08 ± 23.48 , showing moderate quality of life. Among the functional domains, role functioning was highest (72.26 ± 18.92), followed by emotional functioning (67.73 ± 19.45), while cognitive functioning was lowest (56.30 ± 27.15). The most common symptoms were fatigue (83.57 ± 15.39) and pain (79.52 ± 18.57). Colorectal cancer-specific symptoms had very high mean scores, especially flatulence (102.81 ± 36.88), embarrassment (107.61 ± 31.31), sore skin (107.38 ± 32.00), and fecal incontinence (99.28 ± 38.86). Age and gender were significantly associated with several quality of life domains.

Conclusion: Patients with colorectal cancer in Erbil have moderate quality of life with high symptom burden. Age and gender were important factors that influenced quality of life. More supportive care and education are needed to improve the well-being of patients.

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INTRODUCTION

Cancer remains one of the most pressing global health concerns, with an estimated 17 million new cases reported worldwide in 2018 (Flyum et al., 2021). Colorectal cancer (CRC), which arises in the colon or rectum, is among the most common forms. These cancers are often grouped together in research because they share comparable biological features and therapeutic strategies (Liang, 2023). The stage of CRC is determined by how far the disease has spread. At the earliest stage (stage 0), abnormal cells are limited to the inner lining of the intestine and can often be removed through local excision or polypectomy. In stage I, the cancer extends deeper into the intestinal wall, and treatment typically involves surgical resection of the affected section of the bowel, sometimes accompanied by adjuvant therapies such as chemotherapy or radiotherapy (Liang, 2023). Globally, CRC is the third most commonly diagnosed cancer, following lung and breast cancer (Than.,2020).According to the World Health Organization, it represents around 10% of all newly diagnosed cancers, ranking it fourth in incidence worldwide (Liang,2023). The disease is more frequently observed in men than in women, and the risk increases significantly with advancing age (Wang et al.,2023). Both hereditary genetic factors and environmental exposures contribute to its development (Sah et al.,2023). In its early stages, CRC often presents without symptoms, but as the disease progresses, patients may experience rectal bleeding, gastrointestinal disturbances, nutritional deficiencies, and persistent fatigue (Drożdż et al.,2024).Health-related quality of life (HRQoL) refers to a person's perception of their physical, emotional, and social well-being, along with satisfaction in daily functioning (Genesis.,2016). Assessing HRQoL is particularly important in CRC because it highlights the impact of the disease and its treatment beyond survival outcomes (Yu and Ryu. 2023). Common factors that negatively influence HRQoL in cancer patients include fatigue, pain, sleep disturbances, psychological distress, and, in cases involving stoma surgery, challenges with ostomy care (Marcos-Delgado et al., 2024). Although advances in diagnostics and therapy have improved survival, many individuals live with long-term side effects such as bowel dysfunction, anxiety, and chronic

fatigue, which survival rates alone cannot fully capture (Aaronson et al., 1993). HRQoL assessment therefore provides valuable information to clinicians and patients when weighing treatment options and fosters shared decision-making in clinical practice (Bausch et al.,2016).In addition, poor HRQoL has been identified as an independent predictor of mortality among cancer patients, underlining its prognostic importance (Quinten et al.,2009). Identifying specific HRQoL challenges, such as depression, sleep problems, or stoma-related concerns, allows healthcare professionals to deliver targeted interventions that improve overall patient well-being. At a broader level, HRQoL data also support policymakers in evaluating the cost-effectiveness of treatments and in planning survivorship programs tailored to the long-term needs of CRC patients (Husson et al., 2020).Given its high prevalence, mortality, and the burden it places on survivors, CRC is a critical public health issue. Understanding the determinants of HRQoL in individuals with CRC is essential for designing effective supportive care strategies and improving patient-centered outcomes.

METHODS

A descriptive cross-sectional study design was conducted from May to September 2025 among 140 patients with colorectal cancer at Rizgary and Nanakaley Teaching Hospitals in Erbil city. The sample size was calculated based on a 0.01 prevalence in all cancer types in worldwide (Sung et al.,2021), by using $Z^2 p q / d^2$, $z = 95\%$ (1.96), confidence interval, $q = (1-p) = (0.99)$ and 5% margin of error, which gave a required sample of 138. To account for possible result, the final number was rounded to 140. Non-probability, purposive sampling techniques recruited from these two teaching hospitals to collect the relevant study data. Inclusion criteria were patients aged 18 years and older, diagnosed with CRC at least three months before the study, and able to provide informed consent. Patients with severe psychiatric or communication problems were excluded. Ethical approval was obtained from the Ethics Committee at Hawler Medical

University, College of Nursing [code No. 2576]. Permission was also taken from the Directorate of Health, Rizgary and Nanakaley Teaching Hospitals. Written consent was obtained from each patient after explaining the purpose of the study. Data were collected using three tools. The first tool was a questionnaire on sociodemographic characteristics of the study sample included (age, gender, marital status, level of education). The second tool was the EORTC QLQ-C30, (Aaronson et al.,1993)which included 30 questions to measure five functional scales which consisted of (physical, role, emotional, cognitive, and social functioning), nine symptom scales which consisted of (fatigue, nausea, pain, dyspnea, insomnia, appetite loss, constipation, diarrhea, and financial difficulties), and one global health/quality of life scale. Each question had four answers ranged from "not at all" (1) to "very much" (4). The worldwide health-status/quality of life scale featured answers that ranged from very poor (1) to excellent (7). The third tool was the EORTC QLQ-CR29 (Whistance et al.,2009), which is specific for CRC included disease and symptom scales, consisted of 29 questions to measures bowel symptoms, urinary frequency, body image, sexual functioning, and stoma-related problems. Each question had four answers ranged from "not at all" (1) to "very much" (4). The scores were transformed into a 0–100 scale and calculated separately for each domains. In functional scales and global quality of life, higher scores indicate better functioning. In symptom scales, higher scores indicate more severe symptoms. For functional scales, subjects scoring <33.3% shows problem but items with the scoring ≥ 66.7 indicate good functioning, whereas symptom scales with scoring <33.3% have good functioning and those scoring ≥ 66.7 have problem. Data were analyzed using SPSS version 25. Descriptive statistics used in sociodemographic characteristics which presented as frequency, percentage but regarding QLQ-C30 and QLQ-CR29 presented as mean, and standard deviation, 95% CI , scoring ,33.3% and scoring

$\geq 66.7\%$. Scores calculated by using linear regression to find out the predictive factors affects global, functional and symptom scales. A p-value of ≤ 0.05 pointed as a significant.

RESULTS

Table 1. Sociodemographic Characteristics of CRC Patients (N = 140)

Table 1 shows distribution of socio-demographic characteristics of participants. The largest group of patients (32.9%) were among patients aged more than 60 years, while 26.4% were less than 40 years. About the gender more than half of the participants were male (58.6%), while most of them were married (82.9%).Regarding level of education, 23.6% were illiterate. Moreover, the highest percent of the study sample lived in urban areas (87.1%)

Table 2. Quality of Life Scores (EORTC QLQ-C30 and QLQ-CR29)

The mean global health status was 47.08 ± 23.48 in Table 2. For the general quality of life tool (QLQ-C30), four out of five functional scales scored below the good threshold ($\geq 66.7\%$). Physical functioning was 59.85 ± 23.75 , cognitive functioning 56.30 ± 27.15 , social functioning 65.47 ± 22.76 and global health status 47.08 ± 23.48 , these four functioning scales indicating poor functioning. On the other hand, role functioning scored 72.26 ± 18.92 and emotional functioning 67.73 ± 19.45 , which were above the threshold, indicating good functioning. Regarding the symptom scales items, four out of nine symptoms had bad functioning, fatigue 83.57 ± 15.39 followed by pain 79.52 ± 18.57 , appetite loss 70.00 ± 18.45 and financial difficulties 72.38 ± 25.58 . While other five remaining symptoms had good functioning. For the disease-specific tool (QLQ-CR29), two items had problems including body image 49.89 ± 18.70 and sexual interest in men showed very poor results 16.06 ± 19.72 . In terms of CRC-specific symptoms, embarrassment 107.61 ± 31.31 and sore skin 107.38 ± 32.00 and stoma care 105.62 ± 35.23 , were the most problematic, flatulence 102.81 ± 36.88 , and fecal incontinence 99.28 ± 38.86 . Urinary frequency was the least reported problem 52.00 ± 10.54 .

Table 3. Association of predictor Factors with QLQ-C30

Table 3 demonstrated association of predictor factors with QLQ-C30, there was no significant difference between most demographic characteristics and the global health status scale. However, some domains of functioning were significantly related to patient characteristics. Older patients had better scores in physical, emotional, cognitive, and social functioning ($p < 0.05$). At the same time, older age was associated with higher severity of dyspnea and lower sexual interest in men ($p < 0.05$). Regarding the gender was significantly associated with emotional functioning ($p = 0.006$). Gender differences were also observed in several symptoms, including anxiety ($p = 0.003$), dysuria ($p = 0.048$), and buttock pain ($p = 0.009$). Education level was another important predictor. Patients with higher education reported fewer problems with insomnia, dyspnea, constipation, and financial difficulties ($p < 0.05$). Education was also associated with fewer urinary incontinence and taste problems, while lower education was related to more blood and mucus in stool ($p = 0.007$). Marital status did not show any significant effect on the main functional scales. Its role in symptom scales was minimal, with no consistent association.

Table 4 Association of predictor Factors with QLQ-CR29

Table 4 demonstrate association of CRC-specific symptoms (QLQ-CR29) with predictors which showed several significant associations with demographic. Age was significantly related to sexual interest and impotence, with older patients reporting worse outcomes ($p < 0.05$). Gender differences were observed in some symptoms. Male patients reported higher anxiety levels ($p = 0.003$), more dysuria ($p = 0.048$), and greater buttock pain ($p = 0.009$) compared to females. Education level also showed significant associations. Patients with higher education reported fewer urinary incontinence and taste problems, while those with lower education had more blood and mucus in stool ($p = 0.007$). Education and employment status together were also linked to

urinary frequency ($p < 0.05$). Other clinical factors showed associations as well. Tumor location was related to dysuria ($p < 0.05$). Income was significantly associated with sore skin ($p < 0.05$). Marital status showed a strong effect on anxiety and dyspareunia, with married patients reporting more problems ($p < 0.05$).

Table 1: Socio-demographic Characteristics of the colorectal cancer patients.

Variables	Characteristics n=140	F	%
Age group	>40	37	26.4%
	41-50	21	15.0%
	51-60	36	25.7%
	<60	46	32.9%
Gender	Male	82	58.6%
	Female	58	41.4%
Marital state	Single	15	10.7%
	Married	116	82.9%
	Divorce	2	1.4%
Level of education	Widow	7	5.0%
	Illiterate	33	23.6%
	Able to read and write	29	20.7%
	Primary school graduate	26	18.6%
	Secondary school graduate	13	9.3%
	Institute graduate	21	15.0%
	College graduate	18	12.9%
Residential area	Urban	122	87.1%
	Rural	18	12.9%

Note: F = Frequency, % = Percentage

Table 2: Quality of Life Scores (EORTC QLQ-C30 and QLQ-CR29).

Variables	Mean (SD)	95% CI Lower	95% CI Upper	N (%) scoring <33.3	N (%) scoring =>66.7
QLQ-C30 Functional scale					
Global health	47.08±23.48	43.15	51.00	34(24.3)	26(18.6)
Physical function	59.85±23.75	55.88	63.82	16 (11.4)	59 (42.1)
Role function	72.26±18.92	69.09	75.42	13(9.3)	49 (35.0)
Emotional function	67.73±19.45	64.48	70.98	9(6.4)	65(46.4)
Cognitive function	56.30±27.15	51.77	60.84	16(11.4)	41(29.3)
Social function	65.47±22.76	61.67	69.27	7(5.0)	48(34.3)
QLQ-C30 symptom scales					
Fatigue	83.57±15.39	80.99	86.14	10(7.1)	109(77.9)
Nausea	51.54±19.37	48.31	54.78	10(7.1)	18(12.9)
Pain	79.52±18.57	76.41	82.62	1(0.7)	86(61.4)
Dyspnea	36.66±28.91	31.83	41.49	37(26.4)	9(6.4)
Insomnia	61.66±25.57	57.39	65.94	8(5.7)	24(17.1)
Appetite	70.00±18.45	66.91	73.08	21(15.0)	28(20.0)
Constipation	50.71±29.23	45.82	55.59	18(12.9)	18(12.9)
Diarrhea	53.09±27.38	48.51	57.67	13(9.3)	17(12.1)

Health Related Quality of Life

Financial difficulty	72.38±25.58	68.10	76.65	6(4.3)	49(35.0)
QLQ-CR29 Functional scales					
Body image	49.89±18.701	45.81	53.98	12(8.6)	24(17.1)
Anxiety	79.04±25.07	68.94	80.44	18(12.9)	75(53.6)
Weight	68.57±21.07	63.22	71.71	22(15.7)	32(22.9)
Sexual interest (Men)	16.06±19.72	11.75	20.37	47(55.3)	8(9.4)
QLQ-CR29 symptom scales					
Urinary frequency	52.00±10.54	49.70	54.30	2(1.4)	8(5.7)
Blood and mucus	54.01±22.77	49.04	58.99	13(9.3)	20(14.3)
Stool frequency	96.18±41.99	87.01	105.35	4(2.9)	82(58.6)
Urinary incontinence	43.77±28.95	37.45	50.09	34(24.3)	6(4.3)
Dysuria	36.54±29.27	30.15	42.93	32(22.9)	16(11.4)
Abdominal pain	76.66±21.79	70.21	79.18	11(7.9)	57(40.7)
Buttock pain	56.62±30.68	49.92	63.32	8(5.7)	35(25.0)
Flatulence	102.81±36.88	94.75	110.86	2(1.4)	88(62.9)
Dry mouth	48.99±27.71	42.94	55.04	18(12.9)	15(10.7)
Hair loss	52.61±37.94	44.32	60.89	30(21.4)	39(27.90)
Taste problem	57.02±24.70	51.63	62.42	14(10.0)	17(12.1)
Fecal incontinence	99.28±38.86	91.64	108.35	8(5.7)	78(55.7)
Sore skin	107.38±32.00	99.19	113.65	9(6.4)	101(72.1)
Embarrassment	107.61±31.31	101.82	115.04	8(5.7)	101(72.1)
Stoma care	105.62±35.23	97.92	113.31	4(2.9)	98(70.0)
Impotence men	80.72±26.09	75.02	86.42	4(4.8)	47(56.0)
Dyspareunia	79.16±32.76	70.39	87.93	6(10.7)	35(62.5)

Note: M = Mean Score; SD= Standard Deviation; in Functional scale scores below 33.3% indicated poor functioning, while scores of 66.7% or higher indicated good functioning. For symptom scales, scores below 33.3% indicated good condition, while scores of 66.7% or higher indicated problematic symptom.

Table 3: Predictors of Quality of Life of Colorectal Cancer Patients (QLQ-C30)

	Global health/QoL			physical functioning			Role functioning			Emotional functioning			Cognitive functioning			Social functioning		
	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value
Age	0.573	-3.54-4.687	0.783	6.31	2.374-10.25	0.002	6.154	3.12-9.193	0.00	6.382	3.134-9.63	0.00	8.491	4.358-12.624	0.00	4.936	0.99-8.881	0.015
Gender	8.914	0.564-17.26	0.037	2.8	-5.19-10.79	0.489	5.439	-0.73-11.61	0.083	9.351	2.757-15.94	0.006	-1.355	-9.74-7.034	0.75	0.935	-7.075-8.944	0.818
Marital state	-2.5	-9.93-4.943	0.508	0.44	-6.68-7.561	0.902	2.524	-2.97-8.019	0.365	-4.744	-10.62-1.13	0.113	2.378	-5.1-9.851	0.53	-4.33	-11.464-2.805	0.232
Level of education	0.164	-2.57-2.897	0.906	-1.28	-3.9-1.334	0.334	-0.43	-2.45-1.592	0.677	1.773	-0.385-3.931	0.107	-2.998	-5.74_-0.252	0.033	-0.057	-2.678-2.564	0.966
	Fatigue			Nausea			Pain			Dyspnea			Insomnia			Appetite		
	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value
Age	2.495	-0.15-5.144	0.065	1.76	-1.67-5.177	0.312	3.137	0.01-6.263	0.049	9.44	5.078-13.8	0.00	1.344	-3.17-5.863	0.557	2.483	-0.735-5.701	0.129
Gender	4.525	-0.85-9.902	0.098	2.56	-4.38-9.509	0.467	3.557	-2.79-9.903	0.27	-3.947	-12.8-4.909	0.38	7.039	-2.13-16.212	0.131	4.974	-1.558-11.507	0.134
Marital state	1.824	-2.97-6.614	0.453	-2.75	-8.93-3.441	0.382	2.852	-2.8-8.505	0.32	-4.928	-12.82-2.961	0.219	3.61	-4.56-11.782	0.384	-1.237	-7.056-4.582	0.675
Level of education	-0.41	-2.17-1.351	0.647	-0.65	-2.92-1.624	0.573	-1.4	-3.47-0.679	0.186	-4.011	-6.909_-1.112	0.007	0.994	-2.01-3.996	0.514	-0.65	-2.788-1.488	0.548
	Constipation			Diarrhea			Financial difficulties											
	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value									
Age	-0.72	-5.91-4.47	0.784	2.37	-2.41-7.149	0.329	1.151	-3.37-5.672	0.616									
Gender	2.827	-7.71-13.36	0.596	5.93	-3.77-15.64	0.229	-3.76	-12.9-5.416	0.419									
Marital state	0.415	-8.97-9.8	0.93	7.82	-0.82-16.47	0.076	-0.26	-8.44-7.917	0.95									
Level of education	-1.76	-5.21-1.688	0.314	0.64	-2.53-3.82	0.689	-1.34	-4.34-1.666	0.38									

Table 4: Predictors of Colorectal Cancer Patients QLQ-CR29.

	Body image			Anxiety			Weight			Sexual interest (Men)			Urinary frequency			Blood and mucus in stool		
	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value
Age	1.263	-1.99-4.512	0.444	3.48	-0.82-7.777	0.111	0.199	-3.55-3.945	0.916	-4.955	-9.39_-0.521	0.029	-0.122	-2.25-2.002	0.91	-3.405	-7.076-0.267	0.069
Gender	6.03	-0.57-12.63	0.073	13.4	4.681-22.12	0.003	3.943	-3.66-11.55	0.307	-10.29	-46.88-26.29	0.577	3.963	-0.35-8.275	0.071	1.061	-6.391-8.513	0.779
Marital state	-3.92	-9.79-1.96	0.19	-3.01	-10.8-4.761	0.445	1.699	-5.08-8.473	0.621	-2.183	-9.49-5.125	0.554	1.333	-2.51-5.173	0.494	4.53	-2.108-11.169	0.179
Level of education	-1.08	-3.24-1.077	0.323	2.64	-0.21-5.495	0.069	0.024	-2.46-2.513	0.985	1.814	-1.125-4.753	0.223	-0.214	-1.63-1.198	0.765	-2.421	-4.86-0.018	0.052
	Stool frequency			Urinary incontinence			Dysuria			Abdominal pain			Buttock pain			Flatulence		
	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value
Age	-3.72	-11-3.563	0.314	-2.48	-7.63-2.658	0.341	2.857	-2.5-8.217	0.294	1.513	-2.347-5.372	0.44	-1.002	-5.94-3.939	0.689	-1.982	-8.756-4.793	0.564
Gender	-1.03	-15.8-13.76	0.891	-5.18	-15.6-5.254	0.328	11	0.12-21.88	0.048	5.351	-2.484-13.19	0.179	13.36	3.328-23.389	0.009	-2.786	-16.537-10.966	0.689
Marital state	6.268	-6.9-19.44	0.348	4.88	-4.42-14.18	0.301	6.369	-3.32-16.06	0.196	-1.524	-8.503-5.455	0.667	6.77	-2.17-15.705	0.136	4.599	-7.651-16.849	0.459
Level of education	3.293	-1.55-8.132	0.181	-3.44	-6.85_-0.019	0.049	-0.68	-4.24-2.879	0.706	0.917	-1.647-3.481	0.481	1.076	-2.21-4.359	0.518	3.181	-1.32-7.682	0.164
	Dry mouth			Hair loss			Taste problem			Fecal incontinence			Sore skin			Embarrassment		
	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	p-value
Age	3.079	-1.94 8.094	0.227	-4.04	-10.5 2.394	0.216	-1.46	-6.03 3.107	0.528	-3.767	-10.59 3.053	0.277	-3.514	-9.15 2.12	0.22	-1.789	-7.281 3.703	0.521
Gender	1.265	-8.92 11.45	0.806	5.71	-7.35 18.77	0.389	0.623	-8.65 9.899	0.895	-4.008	-17.85 9.836	0.568	-0.278	-11.7 11.159	0.962	-1.77	-12.919 9.379	0.754
Marital state	0.722	-8.35 9.791	0.875	9.05	-2.59 20.69	0.126	3.993	-4.27 12.26	0.341	5.921	-6.411 18.25	0.344	8.759	-1.43 18.946	0.091	3.35	-6.581 13.282	0.506
Level of education	-0.55	-3.88 2.784	0.745	-2.55	-6.83 1.722	0.24	-3.85	-6.89 -0.81	0.013	2.392	-2.14 6.923	0.298	0.495	-3.25 4.238	0.794	2.796	-0.853 6.445	0.132
	Stoma care			Impotence			Dyspareunia											
	B	95%CI	P-value	B	95%CI	P-value	B	95%CI	P-value									
Age	-4.93	-11.4 1.525	0.133	5.89	-0.33 12.12	0.063	4.701	16.2 109.1	0.289									
Gender	-6.24	-19.3 6.866	0.348	-33.2	-70.5 4.032	0.08		-4.11 13.51										
Marital state	6.849	-4.83 18.52	0.248	-9.86	-20.3 0.559	0.063	3.695	-14.3 21.65	0.681									
Level of education	0.239	-4.05 4.528	0.912	-2.57	-6.75 1.607	0.224	-0.59	-6.34 5.157	0.837									

DISCUSSION

Result of present study shows that the majority of patients were aged above 60 years, with a higher proportion of males and married participants, while majority of participants were illiterate and most of them were residents of urban areas. Similar findings were reported in a cross-sectional study in Jordan, which carried out on 74 patients with colorectal cancer who found that CRC predominantly affects older adults and that most patients were married and resided in cities (Mhaidat et al.,2014). Also the findings agrees with result of a study done 101 patients from Egypt in Ain Shams Hospital which showed that older age and low educational level were common among CRC patients (Refay et al., 2024). Moreover, the result of present study are consistent with the finding of an observational study done in Jordan on 108 patient at King Hussein Cancer center who found majority of the patients were age more than 60, male and married (Bayyat et al.,2024).Regarding, health related quality of life in functional and symptom scores of the participants. Present study, role and emotional functioning reported relatively higher mean values, while physical and cognitive functioning were markedly reduced. These results are along with findings from a Malaysian study, done on 160 patients from multiple center Hospitals, which also observed that emotional and social domains were better preserved compared to physical functioning in CRC patients (Magaji et al.,2012). Moreover, this findings agree with a cross sectional study done on 180 patients with colorectal cancer in Iran, which similarly reported that patients experienced significantly lower HRQoL, particularly in social and emotional domains (Dahouri et al.,2024). Regarding, symptom scores, in the present study, particularly fatigue, pain, appetite loss, and financial difficulties affected. These results are in line with the result of Tunisian cohort study, where fatigue and appetite loss were the most frequently reported symptoms affecting daily functioning

(Chamsi.,2023). The CRC-specific QLQ-CR29 scores highlighted, fecal incontinence, sore skin, and embarrassment as severe challenges. It's supported by a study in U.S. who found, sore skin, and financial difficulties, confirming the crucial role of socioeconomic conditions in patient quality of life (Vonk-Klaassen et al., 2016). Similarly, result of another study are in line with this studies result which reported that time after ostomy surgery and treatment type significantly influenced sore skin and stoma-related symptoms in CRC patients(Silva et al.,2020). In addition, a systematic review study showed that ostomy-related problems such as leakage, sore skin, and embarrassment had a profound impact on HRQoL (Torvinen et al.,2013). The current study findings regarding the association between sociodemographic predictors and HRQoL scores demonstrates age was positively associated with better emotional and social functioning but negatively associated with sexual interest and symptoms such as dyspnea, this results are consistent with findings of a cohort study who found that older patients showed greater psychological adaptation despite physical limitations (Marchewczyk.,2025). Also another two studies revealed that emotional and social domains improve over time in CRC patients despite persistent physical symptoms ,Similarly, Jansen et al. found that long-term CRC survivors experienced improvements in psychological and social functioning, although sexual function declined with age (Jansen et al.,2011) and (swiatkowski.,2022). Also, about the gender males reported higher anxiety and pain, this finding aligning with results of a cross sectional study which done in Turkey and Korean, where male CRC patients experienced anxiety and pain burden compared to females (Wang et al.,2023) and (Montazeri.,2009). Furthermore, a study in Iran done and reported that gender as a moderator of HRQoL outcomes across cancer types, including CRC, with men reporting higher distress and pain(Ho et al.,2005). Moreover, this finding are in line with the result of a study which highlighted that male cancer patients generally had more severe

symptom distress, such as pain (Linsell et al.,2012). Furthermore, Education was a significant determinant: higher educational attainment was linked to fewer symptoms such as insomnia, dyspnea, and constipation. This finding is supported by studies from Egypt and Europe, which reported education, plays an important role and acts as a protective factor on patient's quality life (Refay et al., 2024). Also its are consistent with a study who demonstrated that higher education was associated with better global health and functional scores over 10 years post-diagnosis in CRC patients (Świątkowski.,2022). Likewise, confirmed through a systematic review that education, reduces symptom burden, and enhances HRQoL(Montazeri.,2009). Moreover ,about predictors of CRC-specific symptoms. Age and gender were significant factors affecting domains of sexual interest, impotence, dysuria, and buttock pain. Marital status was also associated with higher levels of anxiety and dyspareunia, reflecting the psychosocial burden. These findings are supported by a Korean study, which showed that marital relationships influence both the psychological and sexual domains of CRC patients (Wang et al.,2023).

CONCLUSION

This study showed that colorectal cancer patients in Erbil have moderate quality of life but experience a high burden of symptoms, especially related to fatigue, pain, and bowel or stoma care. Age, gender, and education were important factors that influenced quality of life.

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Competing interests

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Availability of data and materials.

All data reported in this study are available from the corresponding author upon reasonable request.

REFERENCES

- Flyum, I. R., Mahic, S., Grov, E. K., & Joranger, P. 2021. Health-related quality of life in patients with colorectal cancer in the palliative phase: A systematic review and meta-analysis. *BMC Palliative Care*,20(1),144. <https://doi.org/10.1186/s12904-021-00837-9>
- Liang, S. 2023. Factors affecting health related quality of life among patients with colorectal cancer and stoma in Beijing, China (Master's thesis). *Burapha University*. https://digital_collect.lib.buu.ac.th/dcms/files/63910133.pdf
- Than, C. M. 2020. Quality of life among colorectal cancer patients during chemotherapy (Master's thesis). *University of Northern Colorado*. <https://digscholarship.unco.edu/theses/155>
- Wang, L., Langlais, C., Kenfiel, S. A., Van Loon, K., Laffan, A., Atreya, C. E., Venook, A. P. 2023. Quality of life among colorectal cancer survivors participating in a pilot randomized controlled trial of a web-based dietary intervention with text

- messages. *Supportive Care in Cancer*, 31, 155. <https://doi.org/10.1007/s00520-023-07620-x>
- Sah, A. N., Rawal, P., Pathak, M., Joshi, B. C., Bhupendra, G., & Prajapati. 2023. Colorectal cancer. In *Indian Academic Press* (pp. 287–305). <https://doi.org/10.1016/B978-0-443-13870-6.00001-5>
- Drożdż, K., Kamińska, K., Chachaj, A., Truszyński, A., Bober, J., Małyszczak, K., Rząca, M. 2024. Disability, quality of life and emotional problems within a few days after surgery in patients operated due to colorectal cancer in Poland. *Palliative Medicine in Practice*, 18(2). <https://doi.org/10.5603/pmp.98929>
- Genesis, O. 2016. Health-related quality of life after colorectal cancer (Master's thesis). *University of Eastern Finland*. https://erepo.uef.fi/bitstream/handle/123456789/17270/urn_nbn_fi_uef20161315.pdf
- Yu, H., & Ryu, E. 2023. Quality of life of colorectal cancer survivors: Gender differences in inner strength and multiple identities. *Research Square*. <https://doi.org/10.21203/rs.3.rs-3169175/v1>
- Marcos-Delgado, A., Martín-Sánchez, V., Molina-Barceló, A., Alonso-Molero, J., Pérez-Gómez, B., Pollán, M., Chirlaque, M. D. 2024. Health-related quality of life in long-term colorectal cancer survivors. *Healthcare*, 12(19), 1917. <https://doi.org/10.3390/healthcare12191917>
- Aaronson, N. K., Ahmedzai, S., Bergman, B., Bullinger, M., Cull, A., Duez, N. J., Takeda, F. 1993. The European Organization for Research and Treatment of Cancer QLQ-C30: A quality-of-life instrument for use in international clinical trials in oncology. *Journal of the National Cancer Institute*, 85(5), 365–376. <https://doi.org/10.1093/jnci/85.5.365>
- Basch, E., Deal, A. M., Kris, M. G., Scher, H. I., Hudis, C. A., Sabbatini, P., Schrag, D. 2016. Symptom monitoring with patient-reported outcomes during routine cancer treatment: A randomized controlled trial. *Journal of Clinical Oncology*, 34(6), 557–565. <https://doi.org/10.1200/JCO.2015.63.0830>
- Quinten, C., Coens, C., Mauer, M., Comte, S., Sprangers, M. A., Cleeland, C., Bottomley, A. 2009. Baseline quality of life as a prognostic indicator of survival: A meta-analysis of individual patient data from EORTC clinical trials. *The Lancet Oncology*, 10(9), 865–871. [https://doi.org/10.1016/S1470-2045\(09\)70200-1](https://doi.org/10.1016/S1470-2045(09)70200-1)
- Husson, O., de Rooij, B. H., Kieffer, J., Oerlemans, S., Mols, F., Aaronson, N. K., van de Poll-Franse, L. V. 2020. The EORTC QLQ-C30 summary score as prognostic factor for survival of patients with cancer in the “real-world”: Results from the population-based PROFILES registry. *The Oncologist*, 25(4), e722–e732. <https://doi.org/10.1634/theoncologist.2019-0635>
- Sung, H., Ferlay, J., Siegel, R. L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. 2021. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA:

- A Cancer Journal for Clinicians*, 71(3),209–249.
<https://doi.org/10.3322/caac.21660>
- Whistance, R. N., Conroy, T., Chie, W., Costantini, A., Sezer, O., Koller, M., Blazeby, J. M. 2009. Clinical and psychometric validation of the EORTC QLQ-CR29 questionnaire module to assess health-related quality of life in patients with colorectal cancer. *European Journal of Cancer*, 45(17), 3017–3026.
<https://doi.org/10.1016/j.ejca.2009.08.014>
- Mhaidat, N. M., Al-Wedyan, T., Alzoubi, K. H., Al-Efan, Q., Al-Azzam, S. I., Balas, Q. A.,Haddad, H. 2014. Measuring quality of life among colorectal cancer patients in Jordan. *Journal of Palliative Care*, 30(3), 183–188.
<https://doi.org/10.1177/082585971403000302>
- Refay, S., El Khwsky, F., El-Housseni, G., Rostom, A., & El Sayed, I. 2024. Quality of life of colorectal cancer patients: A cross-sectional study, Alexandria, Egypt. *Journal of Medical Research Institute*, 45(1), 1–12.
<https://doi.org/10.21608/jmalexu.2024.347539>
- Bayyat, M. M., Amarin, R., AlDabbas, H., & Akkawi, M. 2024. Quality of life and physical activity levels among colorectal cancer patients: An observational study. *Medicine*, 103(28), e38778.
<https://doi.org/10.1097/MD.00000000000038778>
- Magaji, B. A., Moy, F. M., Law, C. W., & Roslani, A. C. 2012. Health-related quality of life among colorectal cancer patients in Malaysia: Validation of EORTC QLQ-C30 and QLQ-CR29. *BMC Cancer*, 12, 384. <https://doi.org/10.1186/1471-2407-12-384>
- Dahouri, A., Sahebihagh, M. H., & Gilani, N. 2024. Factors associated with sexual dysfunction in patients with colorectal cancer in Iran: A cross-sectional study. *Scientific Reports*, 14, 4915.
<https://doi.org/10.1038/s41598-024-55465-z>
- Chamsi, A. 2023. Assessment of depression, anxiety and fatigue in Tunisian patients in recovery from colon cancer and their impact on quality of life. *Journal of Cancer Research and Clinical Oncology*, 149, 4269–4274.
<https://doi.org/10.1007/s00432-022-04334-1>
- Vonk-Klaassen, S. M., de Vocht, H. M., den Ouden, M. E., Eddes, E. H., & Schuurmans, M. J. 2016. Ostomy-related problems and their impact on quality of life of colorectal cancer ostomates: A systematic review. *European Journal of Oncology Nursing*, 20, 97–106.
<https://doi.org/10.1016/j.ejon.2015.06.007>
- Silva, K. A., Silva, A. R., Lins Neto, J. I. D., Oliveira, P. G., Pimenta, O. S., Lucena, N. M. G., Amorim, M. M. 2020. Time after ostomy surgery and type of treatment are associated with quality of life in colorectal cancer patients. *PLOS ONE*, 15(8), e0239201.
<https://doi.org/10.1371/journal.pone.0239201>
- Torvinen, S., Färkkilä, N., Sintonen, H., Saarto, T., Roine, R. P., Taari, K., Rissanen, P. 2013. Health-related quality of life in colorectal cancer. *Acta Oncologica*, 52(2), 300–308.
<https://doi.org/10.3109/0284186X.2012.741326>

- Marchewczyk, P. (2025). Quality of life outcomes in colorectal cancer survivors. *Quality of Life Research. Advance online publication*. <https://doi.org/10.1007/s11136-025-03918-x>
- Jansen, L., Herrmann, A., Stegmaier, C., Singer, S., Brenner, H., & Arndt, V. 2011. Health-related quality of life during the 10 years after diagnosis of colorectal cancer: A population-based study. *Journal of Clinical Oncology*, 29(24), 3263–3269. <https://doi.org/10.1200/JCO.2010.31.4013>
- Świątkowski, F. 2022. The quality of life of patients with surgically treated colorectal cancer: Impact of stoma formation. *Journal of Clinical Medicine*, 11(20), 6211. <https://doi.org/10.3390/jcm11206211>
- Montazeri, A. 2009. Quality of life data as prognostic indicators of survival in cancer patients: An overview of the literature from 1982 to 2008. *Health and Quality of Life Outcomes*, 7, 102. <https://doi.org/10.1186/1477-7525-7-102>
- Ho, M. Y., Chen, Y. M., Lo, S. S., Lin, W. C., Tsai, C. M., Lee, Y. C., & Wang, J. Y. 2005. Quality of life of patients with advanced non-small-cell lung cancer: Gender-related differences. *Quality of Life Research*, 14(2), 469–478. <https://doi.org/10.1007/s11136-004-5326-5>
- Linsell, L., Sanson-Fisher, R. W., Williams, J., Carey, M., & Paul, C. 2012. The relationship between education and quality of life in cancer patients: A systematic review. *Psycho-Oncology*, 21(6), 624–634. <https://doi.org/10.1002/pon.2046>