

# Evaluation of quality of life and anxiety and depression levels in patients receiving chemotherapy for colorectal cancer: impact of patient education before treatment initiation

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**Background:** As a consequence of the improved survival due to the availability of several treatment option cost-effectiveness and health-related quality of life (HRQoL) issues have gained increasing attention in colorectal cancer (CRC). In the present study, we aimed to evaluate quality of life, level of anxiety and depression before and after a 6-month follow-up period in chemotherapy receiving patients with CRC.

**Methods:** The study was conducted in 50 patients with colon or rectal cancer. All patients were informed and educated about their disease and treatment before getting the treatment and were followed for 6 months, during which they received chemotherapy. A “Questionnaire Form” to collect patient demographic characteristics; the “EORTC QLQ-C30 Scale” and “EQ-5D Scale” to evaluate patient’s quality of life; and the “Hospital Anxiety and Depression (HAD) Scale” to evaluate the level of anxiety and depression status of patients, were used as data collecting tools.

**Results:** Quality of life scores in all functional fields were high in the sixth course when compared to the first according to EORTC QLQ-C30 Scale, reaching to statistically significant level in emotional function score compared to the initial ones ( $P < 0.05$ ). Moreover quality of life score measured in the sixth month with EQ-5D was statistically significantly higher than the initial.

**Conclusions:** These data, shows that with proper patient management, quality of life score, and the anxiety and depression levels improve during the course of treatment.

**Keywords:** Education; colorectal cancer (CRC); patient; quality of life; anxiety; depression

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## Introduction

Although colorectal cancer (CRC) incidence is variable in the different geographical regions of the world, it is the most common cancer of the gastrointestinal system. Globally prostate, lung, and colon cancers are the first three cancers for men; and breast, colon, and lung cancers are the first three cancers seen in women (1,2). According to the Turkish Ministry of Health data for the year 2008, CRC is

the third after breast and thyroid cancers in women, and the fourth after lung, prostate and bladder cancers in men (2).

Quality of life is an important outcome measure in the evaluation of health status and treatment efficacy. Health related quality of life is a component of general life quality, which is mainly determined by the individual’s disease, and may also be affected by clinical interventions. Cancer may cause severe and intense problems both because of the disease itself, and/or treatment, which may significantly

affect the quality of life of the patients (3).

Emotional stress due to cancer diagnosis may unfavorably affect quality of life. Patients diagnosed with cancer may experience difficulties in dealing and adapting to daily life after the disease. In addition to being a cause of mortality for millions of people, cancer is also a disease with a high risk of psychiatric disorders. The most common psychiatric problems in cancer patients are adaptation disorders and major depression, which may affect patient life quality, self-care, treatment compliance, and severity, progression and response to the treatment in the course of time (4).

Evaluation of quality of life in cancer patients has gained importance because of cancer treatment is toxic and limited treatment efficacy. Quality of life is one of the predictors of survival in CRC patients (5,6). Problems such as diarrhea, constipation, dyspnea, fatigue, insomnia, and economic difficulties may affect physical, emotional, and social well-being of the patients and impairs quality of life (7,8). Treatment modalities such as surgery, chemotherapy, and radiotherapy may adversely affect patient's life quality (9,10). However chemotherapy favorable affects the quality of life in advanced CRC independently from prolongation of overall life expectancy (11). In the present study, we aimed to evaluate life quality, anxiety and depression levels before and after 6-month follow up period in chemotherapy receiving patients with CRC.

## Patients and methods

A total of 65 patients with colon or rectum cancer, who were receiving chemotherapy between years 2010 and 2011, were enrolled in the study. However, 14 patients transferred their treatment schedules to another healthcare service units and 1 patient died, so the study was completed with 50 patients. Patients were followed up for 6 months during their chemotherapy periods. Patients were informed about treatments and their side effects before starting chemotherapy, by one of the researchers, who were working as a training nurse at the chemotherapy unit. A "Questionnaire Form" to collect patient demographic characteristics; the "EORTC QLQ-C30 Scale" and "EQ-5D Scale" to evaluate patients' life quality; and the "Hospital Anxiety and Depression Measure" to evaluate anxiety and depression state of patients were used as data collecting tools.

## Questionnaire form

It includes questions about sociodemographic and disease

state of patients such as age, gender, level of education, economic status, disease stage, and treatments they received.

## EORTC QLQ-C30 Scale

This scale contains 30 questions and three headings like general well-being, functional difficulties, and symptom control, and it was developed by Aaronson *et al.* (12). Quality of Life Evaluation Questionnaire containing 30 questions (QLQ-30), which was developed by European Cancer Research and Treatment Center (EORTC), was given to patients to evaluate physical well-being, mental well-being, social life state, metabolic and general states. "Yes" and "No" answers were used only for questions related to physical autonomy in the questionnaire. Answer 'No' implies positive, whereas 'Yes' implies negative conditions. Answers of other questions are made up of 'None', 'Very less', 'Fairly' and 'Much'. Answers of 'None' and 'Very less' imply positive, whereas 'Fair' and 'Much' imply negative conditions. For answers of questions 29 and 30, which inquired about general well-being, "1-3" implied negative; "4" implied moderate; and "5-7" implied positive conditions. Scores related to functional and global health states were calculated according to the manual of scoring for EORTC QLQ-C30. Each parameter had a score between 0 and 100. While high score in the functional scale indicated good health state, high score in the symptom scale indicated excessive symptoms (12,13). The scale was translated into Turkish and its content validation. The reliability study was performed by Beşer and Oz; and the Cronbach alpha coefficient was determined as  $r=0.9014$  (13). These studies validated the scale and showed that it was a reliable tool in assessing quality of life in Turkish patients (12,13).

## EQ-5D Scale

EQ-5D is a self-reporting scale. It helps the evaluation of movement, self-care, routine daily activities, feeling of pain/discomfort, and anxiety/depression in five questions. The scale was developed in 1990 by the EuroQoL working group (14). The validation and reliability study of the scale was performed in our country in 2007 by Eser *et al.* (15). Different health states can be defined as five-digit number sets. For example, 11,111 indicated that there was no problem in five dimensions; 21,213 indicated that there were some problems related to the movement, no problem with self-care, some problems with daily activities, no problem with pain or discomfort, and the presence of severe

anxiety or depression. In the present study, the EQ-5D index score was calculated by using value table revealed as the result of the study conducted by York University. There was also a visual analogue scale (VAS) from 0 to 100 points in the scale for participants to self-evaluate their health states (0, the worst health state that could be imagined; 100, the best health state that could be imagined) (14,15).

### *Hospital anxiety depression (HAD) measure*

The HAD was developed to define risk and levels of anxiety and depression, as well as to measure their intensity changes for patients in 1983 by Zigmond and Snaith (16). The validation and reliability study of the scale was performed in Turkey in 1997 by Aydemir O (17). It is used to define the risk group for anxiety and depression in a short time among patients with physical illnesses and who applied to the primary healthcare units rather than diagnosing them. In a total of 14 questions, seven of them (odd numbers) measure anxiety, while the remaining seven (even numbers) measure depression. Answers are scored as in the quartet Likert style between 0 and 3 points. Each item has a different point in the scale. Items no 1, 3, 5, 6, 8, 10, 11 and 13 show a decreasing intensity, and they are scored as 3, 2, 1, and 0. On the other hand, items no 2, 4, 7, 9, 12 and 14 are scored as 0, 1, 2, and 3. For the anxiety sub-scale, points of items no 1, 3, 5, 7, 9, 11 and 13 are added up; points of items no 2, 4, 6, 8, 10, 12 and 14 are added up for the depression sub-scale. The lowest score that patients can receive from both sub-scales is "0 point", and the highest is "21 points". The cut-off points for the Turkish form of HAD scale is defined as 10 for the anxiety subscale (HAD-A), and as 7 for the depression sub-scale (HAD-D) (16,17).

## **Results**

The mean age of the patients was  $57.04 \pm 11.28$  years, and 62% of them were male. The median age was 56.50 (min: 29, max: 77) years, and 6% (n=3) of the patients were within 29-36 years; 4% (n=2) were within 37-44 years; 24% (n=12) were within 45-52 years; 26% (n=13) were within 55-60 years; while 40% (n=20) were at and above 60 years. All patients were covered by national social security system, and 72% of them defined their economic level as moderate. Of the patients, 36% was university graduate, while 34% were only primary school graduate. Seventy percent (n=35) of patients had colon cancer, and 30% (n=15) had rectum cancer. Of the patients, 40% (n=20) were in stage II;

32% (n=16) were in stage III; while 28% (n=14) were in stage IV. Chemotherapy regimens used were irinotecan-5-fluorouracil-folinic acid+bevacizumab (folfiri-BEV), oxaliplatin-5-fluorouracil-folinic acid (FOLFOX-4), or 5-fluorouracil-folinic acid (FU/FA). Mean EORTC QLQ-C30 quality of life scores of patients in the first and last courses of the treatment were calculated. Patient scores in all functional fields were high. However, only the emotional functional score was significantly higher in the sixth course of treatment ( $P < 0.05$ ). There was no significant difference between EORTC QLQ-C30 general health conditions and global quality of life scores of patients the first and sixth courses (Tables 1,2).

Patients reported lower pain scores and experienced less pain in the sixth course of treatment than the first ( $P < 0.05$ ). Other symptom scores of patients were generally higher in the sixth course, but there was no statistically significant difference ( $P > 0.05$ ). The distribution of EQ-5D general health scale responses of patients is given in Table 3. The frequency rates of EQ-5D items were 74% for movement, 86% for self-care, 72% for routine activities, 74% for pain/discomfort, and 74% for anxiety/depression in the sixth course. Patients who had no problem in the five fields during the sixth course had decreased rates of problems than they had in the first course of treatment (82%, 82%, 62%, 58%, and 60% in the same order). The mean EQ-5D health benefit index of patients was between  $0.73 \pm 0.25$  and 0.10-1.0; and it was between  $0.83 \pm 0.22$  and 0.19-1.00 in the sixth course.

There was a statistically significant increase in patient quality of life measured in the sixth month by using EQ-5D ( $P < 0.05$ ). The mean EQ-5D VAS score was  $74.3 \pm 15.7$  in the first course, and  $72.0 \pm 13.6$  in the sixth course.

EQ-5D index, EQ-5D VAS and HSD measurement score correlations at the end of first and sixth courses are given in Table 4. According to the table, there was a weak negative correlation in the first course and moderate negative correlation in the sixth course between EQ-5D index and HAD-A scores ( $P < 0.05$ ). Therefore, it may be claimed that as EQ-5D quality of life increases, anxiety and depression of patients decreases. There was a moderate negative correlation in the sixth course of treatment between EQ-5D index and HAD-D scores ( $P < 0.05$ ). Therefore, it may be claimed that as EQ-5D quality of life is increased, depression is decreased. A weak moderate correlation was detected in the quality of life measured by EQ-5D VAS between the first and sixth courses of treatment ( $P < 0.05$ ). A weak negative correlation

**Table 1** Mean of patient EORTC QLQ-C30 scores in the first and sixth treatment courses (n=50)

	First course				Sixth course				P value
	Median	Mean ± standard deviation	Interpercentile range	Range	Median	Mean ± standard deviation	Interpercentile range	Range	
General health state	66.66	66.16±20.78	50.00-83.33	16.67-100	66.66	65.66±15.39	58.33-68.75	16.67-100	0.78
Physical function	83.33	79.20±19.40	66.66-93.33	26.67-100	86.66	80.53±15.69	73.33-86.66	33.33-100	0.44
Role function	100	85.33±23.96	66.66-100	0-100	100.00	87.66±20.70	66.66-100	16.67-100	0.73
Emotional function	75.00	71.16±21.90	56.25-85.41	0-100	83.33	81.00±17.25	75.00-91.66	25.00-100	0.001
Cognitive function	100	90.00±15.79	83.33-100	33.33-100	100.00	91.00±14.36	83.33-100	50.00-100	0.73
Social function	83.33	80.00±25.64	66.66-100	0-100	83.33	80.00±15.43	66.66-83.33	33.33-100	0.80
<b>Symptoms</b>									
Fatigue	33.33	30.88±22.36	11.11-44.44	0.00-77.78	33.33	38.22±19.84	33.33-44.44	0-100	0.07
Nausea and vomiting	0.00	10.00±21.56	0.00-16.66	0.00-100	0.00	11.33±20.32	0-16.66	0-100	0.65
Pain	16.66	18.66±25.78	0.00-33.33	0.00-100	0.00	10.66±19.27	0.00-16.66	0-66.67	0.03
Dyspnea	0.00	10.00±20.48	0.00-8.33	0.00-100	0.00	8.66±17.57	0.00-0.00	0-66.67	0.80
Insomnia	33.33	26.66±29.35	0.00-33.33	0.00-100	33.33	33.33±19.04	33.33-33.33	0-100	0.09
Loss of appetite	16.66	22.00±26.60	0.00-33.33	0.00-100	0.00	14.00±22.42	0.00-33.33	0-100	0.06
Constipation	0.00	20.66±33.59	0.00-33.33	0.00-100	0.00	12.00±24.98	0.00-8.33	0-100	0.10
Diarrhea	0.00	22.66±32.60	0.00-33.33	0.00-100	33.33	32.66±25.63	25.00-33.33	0-100	0.05
Economic difficulties	33.33	32.66±34.00	0.00-66.66	0.00-100	33.33	31.33±22.74	33.33-33.33	0.00-100	0.60

**Table 2** Frequency distribution of answers given for each item of the EQ-5D scale at the end of the first and sixth treatment courses

	First course (%)			Sixth course (%)		
	No problem	Some problem	Severe problem	No problem	Some problem	Severe problem
Movement	72	28	–	74	26	–
Self-care	82	14	4%	86	14	–
Routine activities	62	32	6%	72	26	2
Pain/discomfort	58	36	6%	74	24	2
Anxiety/depression	60	40	–	74	26	–

**Table 3** EQ-5D index, EQ-5D VAS, HSD scale scores at the end of the first and sixth treatment courses

	First course	Sixth course	P value
EQ-5D index score	0.73±0.25	0.83±0.22	0.006
EQ-5D VAS score	74.3±15.7	72.0±13.6	0.400
HAD-A score	5.68±4.19	5.52±3.71	0.960
HAD-D score	3.62±3.48	4.30±3.22	0.080

VAS, visual analogue scale; HAD, hospital anxiety depression.

was reported between general health state/global life quality measured by EORTCQLQ-C30 and HAD-A, HAD-D scores; however, there was a weak correlation between EORTCQLQ-C30 and HAD-A score in the sixth course, and a moderate negative correlation between EORTCQLQ-C30 and HAD-D score in the sixth course ( $P<0.05$ ). According to data from quality of life scales, it may be claimed that quality of life is better, but anxiety and depression levels are low in the sixth course.

**Table 4** EQ-5D index, EQ-5D VAS and HSD scale score correlations at the end of the first and sixth treatment courses

	First course (Pearson correlation, P)	Sixth course (Pearson correlation, P)
EQ-5D index—HAD-A score	-0.265, 0.06	-0.706, 0.00
EQ-5D index—HAD-D score	-0.266, 0.06	-0.677, 0.00
EQ-5D index—EQ5DVAS	0.617, 0.00	0.424, 0.02
EQ-5D VAS—HAD-A score	-0.220, 0.12	-0.213, 0.13
EQ-5D-VAS—HAD-D score	-0.400, 0.004	-0.386, 0.006
EORTCQLQ-C30 (General health state)—HAD-A score	-0.297, 0.036	-0.394, 0.005
EORTCQLQ-C30 (General health state)—HAD-D score	-0.343, 0.01	-0.546, 0.00

VAS, visual analogue scale; HAD, hospital anxiety depression.

## Discussion

Significant portion of patients who are admitted to hospitals due to CRC are either locally advanced or metastatic at the time of diagnosis, therefore need chemotherapy as apart from their treatment. Chemotherapy reduces risk of recurrence in locally advanced disease and prolongs survival and improves the quality of life in locally advanced and metastatic stage (18-20). In our study patient life quality was better, and the anxiety and depression scores were lower after the sixth course when compared to the first course of treatment. Wan Puteh *et al.* (21) reported that emotional, cognitive, and social functions of CRC patients with advanced stages were deteriorated; they experienced more pain, dyspnea, diarrhea, and economic difficulties, but as new treatment options were developed, their survival rates increased. Similarly, majority of our patients were also at the advanced stage with deteriorating emotional functional scores at the end of the sixth course of treatment. However, the patients experienced less pain related symptoms at the end of the sixth treatment course. We believe that this is caused by deterioration of emotional states of patients due to the disease and symptoms related to the disease, but intensity and severity of patient symptoms were decreased as a result of the treatment. Yalman *et al.* (20) reported that patients with rectal cancer that adjuvant chemotherapy after surgery increased survival rate by 5 years. O'Connell *et al.* (19) reported that 6-month adjuvant chemotherapy given post-operatively had positive effects on patient survival rates, and on prevention of tumor recurrence. In addition to the six course of chemotherapy in our study, patient training and regular follow up had positive impacts on the patient's dealing with the disease and on the treatment period, and also positively affected patient life quality. In previous studies, it was also reported that psychosocial support,

training and regular follow up of cancer patients receiving chemotherapy improved emotional, physical well-being, and quality of life of the patients (7,22). In our study, a moderate negative correlation was determined in the sixth course of treatment between EQ-5D life quality and HAD-A, and HAD-D scale scores ( $P < 0.05$ ). A weak negative correlation was reported between general health state/global life quality measured by EORTCQLQ-C30 and HAD-A, HAD-D scores; however, there was a weak correlation between EORTCQLQ-C30 and HAD-A score in the sixth course, and a moderate negative correlation between EORTCQLQ-C30 and HAD-D score in the sixth course ( $P < 0.05$ ). In the study conducted by Kutlu *et al.* (4), data obtained in life quality fields such as general health and life satisfaction, physical health, social relationships, psychological health and social environment were significantly higher in patients without depression than in those with depression, when life quality scores and depression state were compared. Beser and Oz (13) reported in their study that general well-being and physical function score out of the life quality subgroups before and after chemotherapy were lower in patients with depression than their counterparts ( $P < 0.05$ ). Alacacioglu *et al.* (23) reported that EORTC-QLQ-C30 global life quality scores were significantly lower in CRC patients with high anxiety and depression levels. Similar to our study, Tsunoda *et al.* (24) reported that depression affected EORTC-QLQ-C30 global life quality more strongly than anxiety in CRC patients.

## Conclusions

In conclusion, our study results indicate that patient life quality is better at the end of the sixth treatment course than the first. We believe that regular chemotherapy and patient follow up, and patient education before treatment initiation are important in the favorable outcomes.

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