RESEARCH ARTICLE

Anxiety, Depression Levels and Quality of Life in Patients with Gastrointestinal Cancer in Turkey

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Abstract

Background: Cancer is a major public health problem in many parts of the world. Gastrointestinal (GI) cancers are responsible for 20% of all cancer-related deaths. In Turkey, stomach cancers account for 8.9%, colon cancer for 6.9%, and pancreatic cancer for 5.9%. This study examined the anxiety-depression levels and the quality of life of patients with GI cancer. Materials and Methods: This descriptive study was carried out on 335 adult patients who had gastrointestinal cancer and who were hospitalized in medical oncology clinics. Data were collected by using hospital anxiety and depression scale, EORTC QLQ C-30 and a patient information form. Results: Patients who were male and secondary school graduates/graduates/postgraduates experienced more functional difficulties. Patients with poor economic status experienced more symptoms. Patient general well-being decreased with increase disease duration. The level of functional difficulties decreased with an increasing number of hospital stays. Anxiety scores increased with decreasing age. Both anxiety and depression scores increased with increasing disease duration. Patients who were female, single/widowed/divorced, and literate/elementary school graduates had higher anxiety and depression scores. Life quality decreased with increasing anxiety and depression. Conclusions: Patients should be supported to prevent anxiety and depression, and should be followed up with this in mind.

Keywords: Gastrointestinal cancer - anxiety - depression - life quality - Turkey

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Introduction

Cancer is a major public health problem in many parts of the world (Siegal et al., 2014). According to the World Health Organization's (WHO) 2014 report on cancer, the number of cancer patients is estimated to reach 22 million in the next 20 years (Stewart and Wild, 2014). According to Turkish Statistical Institute data in 2013, cancer is the second leading cause of death (21.3%) after cardiovascular diseases. In Turkey, stomach cancers are responsible for 8.9% of all cancer-related deaths, colon cancer is responsible for 6.9%, and pancreatic cancer is responsible for 5.9%. Gastrointestinal (GI) cancers are among the top five cancers that lead to death (Gultekin and Boztas, 2014). GI cancers are responsible for 20% of all cancer-related deaths (Alıcı et al., 2006). Today, due to improved life standards, widespread healthcare services and increased social awareness, more cancer patients can be diagnosed. Different studies have reported that the number of cancer patients in Turkey has doubled in the last ten years (Yardım et al., 2007).

Cancer, while leading to a vast number of deaths, also increases the risk of psychiatric diseases (Tokgoz et al., 2008). Surgical interventions, long-term and intensive treatments (e.g. radiotherapy and chemotherapy), and uncertainties during disease progression can lead to symptoms including anxiety, fear, and depression (Dedeli et al., 2009). Psychological trauma that starts with cancer diagnosis lasts longer, and increases during the chemotherapy period, which requires multiple hospital stays. Previous studies have shown that 29-47% of cancer patients have a psychological disorder that can be diagnosed (Atesci et al., 2003; Wong-Kim and Bloom, 2005; Friedman et al., 2006; Ozkan et al., 2007).

Cancer is a source of stress that affects the life quality of patients (Cheng et al., 2012). Different studies have reported that anxiety and depression, which occur during diagnosis and treatment, increase the frequency of physical and other psychological symptoms, have a negative effect on life quality, and decrease the adaptation to treatment (Stein et al., 2003; Kutlu et al., 2011). In 2009, a Dutch study on 1429 cancer patients demonstrated that patients with GI cancer, lymphoma, and hematological cancers have lower life quality compared to patients with other types of cancer (van den Beuken-van Everdingen et al., 2009). The diagnosis and treatment of psychiatric disorders will increase patients' adaptation to treatment and their life quality. In this regard, it is crucial to identify

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the underlying psychological disorders and the factors affecting these disorders to be able to understand the patient, make the adaptation of the patient easier, and to plan the appropriate approach (Kutlu et al., 2011).

Nurses play a significant role during the diagnosis and treatment (Lin et al. 2007). It is known that nurses have significant roles in the management of symptoms, evaluation of functional status, sharing feelings and thoughts, and increasing life quality (Bektas and Akdemir, 2006). By considering the individual and cultural features of patients, as well as their biopsychosocial requirements, and providing them with education and counseling support the patients and their relatives, and make them stronger (Shives, 2008; Hallac and Oz, 2011). Therefore, determining anxiety and depression levels in cancer patients, their life quality, and factors affecting these parameters will contribute to nurses working in this field. The aim of the present study was to determine the anxiety-depression levels, and the life quality of patients with GI cancer.

Materials and Methods

Design

This descriptive study was performed to determine the anxiety-depression and life quality levels in patients with GI cancer.

Participants

The study population consisted of patients with GI cancer, who were admitted to the oncology clinics of four different hospitals in the Ankara city center. In 2013, a total of 2611 cancer patients were admitted to these hospitals. The "sampling with finite population" method was used to calculate the study population. Three hundred thirty-five patients were included in the study population. Inclusion criteria were as follows: no problems in cognitive functions, being diagnosed with GI cancer, being diagnosed at least three months prior to the study, being 18 years or older, being literate, and a willingness to participate in the study.

Data collection tools

The "Patient Information Form", "Hospital Anxiety Depression Scale (HADS), and "European Organization for Research and Treatment of Cancer Core QoL Questionnaire (EORTC QLQ C-30) were used as data collection tools.

Patient information form: The form consists of questions regarding sociodemographic characteristics, disease, and treatment.

HADS: This scale was developed by Zigmond and Snaith (1983), and determines the risk of anxiety and depression in patients. Turkish validity and reliability were assessed by Aydemir et al. (1997). HADS scale is a four-point Likert scale. The cut-off value is 10 for anxiety, and 7 for depression.

EORTC QLQ-C30: This scale was developed by Aaronson et al (1993). Turkish validity and reliability were assessed by Guzelant et al. (2004). EORTC QLQ-C30 has three subscales: "general well-being (QL2)", "functional difficulties" and "symptoms". Having high scores in the general well-being subscale, and low scores in functional difficulties and symptoms subscales indicate high life quality.

Application

Patients who accepted to participate in the study completed the patient information form, HADS, and EORTC-QLQ-C30 scales. This stage of the study was carried out between October 2013 and May 2014.

Ethics statement

Written consent was obtained from head physicians of the hospitals and Turkish Institution of Public Hospitals. These written consent forms were used for admission to the institutional ethics committee. Written consent was obtained from Gazi University Clinical Research Ethics Committee (date: 24.03.2014, decision number: 171). Patients were provided information about the study. Written and verbal consent were obtained from the patients.

Data analysis

The Kruskall-Wallis variance analysis, Mann-Whitney U-test, and Mann-Whitney U-test with Bonferroni correction were used for statistical analysis. Spearman's correlation was used to analyze the correlation between the variables. P values <0.05 were considered as statistically significant.

Study limitations

Patients who were included in this study did not have the same disease stage and treatment. Disease stage and treatment can affect life quality and response to disease differently. Thus, the lack of a homogenous sample population and the presence of different treatments represent a major limitation of this study.

Results

Descriptive features

The mean age was 55.0±11.14 years. Among the patients, 64.5% were male, 60% were literate/elementary school graduates, 88.1% were married, and 78.3% had moderate socioeconomical status. Forty-four point four percent of the patients were diagnosed with colon cancer, and 57.3% of the patients had metastasis. Eighty-two point one percent of the patients received chemotherapy, and 17.9% of the patients received supportive care (treatment for side effects, terminal patients, and patients waiting for chemoembolization). Among the patients, 92.8% knew their diagnosis, and 66.8% thought that their disease was curable (Table 1).

HADS scores

The mean anxiety subscale score was 6.59±4.91, and the mean depression subscale score was 6.34±4.85. We found a significant negative correlation between age and mean anxiety score ($r=-0.015$, $p=0.006$). On the other hand, there was no significant correlation between age and mean depression score.

The mean anxiety (p=0.023) and depression (p=0.004) scores were higher in females compared to males. The mean anxiety score was higher in patients who were literate/elementary school graduate compared to patients who were secondary school graduates (Z=-2.261; p=0.024) and patients who were graduate/postgraduates (Z=-2.276; p=0.023). Patients who were literate/elementary school graduate had highest mean depression score. The mean anxiety (Z=-2.264; p=0.024) and depression (Z=-2.085; p=0.037) scores were higher in patients who were single/widowed/divorced compared to patients who were married. We did not find a significant difference in mean anxiety and depression scores with respect to economic status (p>0.05) (Table 2).

We did not find a significant difference in mean anxiety score with respect to patients' diagnosis (p=0.454). On the other hand, the mean depression score was higher in patients who were diagnosed with stomach cancer, compared to patients who were diagnosed with colon cancer (Z=-3.656; p=0.000). Moreover, the mean anxiety (Z=-2.001; p=0.045) and depression (Z=-3.603; p=0.000) scores were higher in patients who had metastasis. The mean anxiety (Z=- 2.331; p=0.019) and depression scores (Z=-4.685; p=0.000) were higher in patients who received supportive care, compared to patients who received chemotherapy. The mean anxiety (Z=-2.680; p=0.007) and depression scores (Z=-2.768; p=0.006) were higher in patients who did not know their disease, compared to patients who knew their disease. The mean anxiety (Z=-3.833; p=0.000) and depression (Z=-4.726; p=0.000) scores were higher in patients who thought that their disease required "long-term treatment," compared to patients who considered their disease to be "treatable." The mean depression score was significantly higher in patients who considered their disease to be "untreatable," compared to patients who considered their disease to be "treatable" (Z=-3.459; p=0.001) (Table 3).

Table 1. Descriptive Features of Patients (n=335)

Descriptive features	n	%
Age (Mean =55.0 SD=11.14 Min.=20 Max=87		
Gender		
Female	119	35.5
Male	216	64.5
Educational level		
Literate/Elementary school	201	60.0
Secondary school	39	11.7
High school	53	15.8
Graduate/postgraduate*	42	12.5
Marital status		
Married	295	88.1
Single/Widowed/Divorced	40	11.9
Employment		
Yes	64	19.2
No	271	80.8
Economic status		
Good	37	11.0
Moderate	262	78.3
Poor	36	10.7
Medical diagnosis		
Colon cancer	138	44.4
Rectum cancer	75	24.1
Stomach cancer	84	27.0
Other**	14	4.5
Metastasis		
Yes	192	57.3
No	143	42.7
Reason for hospital stay		
Supportive care***	60	17.9
Chemotherapy	274	82.1
Knowledge about diagnosis		
Knows diagnosis	311	92.8
Does not know diagnosis****	24	7.2
Thoughts about the disease		
Treatable	224	66.8
Untreatable	21	6.4
Requires long-term treatment	90	26.8

* Graduate: 40 patients; postgraduate: 2 patients (Master degree); ** Other: Esophageal cancer (9 patients), tongue cancer (1 patient), pancreatic cancer (2 patients), gallbladder cancer (1 patient), and liver cancer (1 patient); ***: Supportive care: Patients who receive supportive care for side effects (n=55), terminal patients (n=1), patients waiting for chemoembolization and similar treatments (n=4); ***: Patients who think that they are hospitalized for infection, difficulty in swallowing, constipation, pain; patients who have no idea about the reason for their hospitalization

We did not find a significant correlation between the number of hospital stays and mean anxiety and depression scores. On the other hand, we found a significant positive correlation between disease duration and mean anxiety score (r=0.141, p=0.010) and disease duration and mean depression score (r=0.140, p=0.010).

EORTC QLQ C-30 scores

The mean QL2 score was 58.03±24.67, the mean functional difficulties score was 69.94±21.00. The mean symptoms score was 33.01±20.22. There was no significant correlation between age and life quality.

There was no significant difference in mean QL2 scores between the genders. The mean functional difficulties score was higher in males compared to females (p=0.000); on the other hand, the mean symptoms score was higher in females compared to males (p=0.002). We did not find any significant difference in mean QL2 scores with respect to educational status (p=0.143). We found a significant difference in mean functional difficulties scores (p=0.008) and mean symptoms scores (p=0.004) with respect to educational status. The mean functional difficulties score was higher in patients who were secondary school graduates, compared to patients who were literate/elementary school graduates (Z=-2.607; p=0.009). Similarly, the mean functional difficulties score was higher in patients who were graduate/postgraduates, compared to patients who were literate/elementary school graduates (Z=-2.361; p=0.018). The mean symptoms score was higher in patients who were literate/elementary school graduates compared to patients who were secondary school graduates (Z=-2.742; p=0.006), patients who were high school graduates (Z=-2.194; p=0.028), and patients who were graduate/postgraduates (Z=-2.299; p=0.022). We did not find any significant difference in mean EORTC QLQ-C30 subscale scores with respect to marital status (p>0.05). Furthermore, there was no significant difference in mean QL2 (p=0.509) and mean functional difficulties scores (p=0.196) with respect to economic status. On the other hand, the mean symptoms score was higher in

Table 2. The Mean EORTC QLQ and HAD Scores According to Sociodemographic Features

Sociodemographic features		EORTC QLQ C-30									
		QL2			Functional difficulties				Symptoms		
		n	Mean	SD	Test	Mean	SD	Test	Mean	SD	Test
Gender	Female	119	58.68	24.31	Z= -0.388	65.22	19.58	Z= -3.714	37.06	19.22	Z= -3.167
	Male	216	57.67	24.91	p= 0.698	77.46	24.58	p= 0.000	30.79	20.45	p= 0.002
Educational level	Literate / Elementary school	201	55.88	25.8	X^2= 5.432	67.12ab	20.85	X^2= 11.744	35.96[abc]	19.75	X^2= 13.107
	Secondary school	39	62.82	24.24	p= 0.143	75.27[a]	21.30	p= 0.008	27.67[a]	22.30	p=0.004
	High school	53	57.86	24.20		73.20	20.11		29.26[b]	19.94	
	Graduate / postgraduate	42	64.08	22.80		74.39b	19.59		28.63[c]	18.79	
Marital status	Married	295	58.27	25.4	Z= -0.484	70.59	20.62	Z= -1.296	32.67	20.24	Z= -0.880
	Single/ widowed/ divorced	40	56.25	21.90	p= 0.628	65.10	23.30	p= 0.195	35.6	20.1	p= 0.379
Economic status	Good	37	60.81	29.25		73.21	21.15		31.46	22.55	
	Moderate	262	57.82	24.27	X^2= 1.350	70.22	20.76	X^2= 3.258	31.93[a]	19.8	X^2= 6.512
	Poor	36	56.71	22.87	p= 0.509	64.50	22.14	p= 0.196	42.52[a]	23.63	p= 0.039

Sociodemographic features		HAD					
		Anxiety			Depression		
		Mean	SD	Test	Mean	SD	Test
Gender	Female	7.36	5.08	Z= -2.277	7.21	4.75	Z= -2.856
	Male	6.16	4.77	p= 0.023	5.86	4.85	p= 0.004
Educational level	Literate /						
	Elementary school	7.16ab	5.01		7.03[abc]	4.81	
	Secondary school	5.23a	4.05	X^2= 9.096	5.02c	4.51	X^2= 13.608
	High school	6.45	5.31	p= 0.028	5.75a	5.06	p= 0.003
	Graduate / postgraduate	5.26b	4.24		5.00b	4.59	
Marital status	Married	6.39	4.87	Z= -2.264	6.14	4.79	Z= -2.085
	Single/ widowed/ divorced	8.05	4.99	p= 0.024	7.80	5.10	p= 0.037
Economic status	Good	6.16	4.76		5.89	5.02	
	Moderate	6.59	4.91	X^2= 0.282	6.20	4.83	X^2= 4.654
	Poor	6.97	5.19	p= 0.868	7.77	4.68	p= 0.098

" X^2= Kruskal Wallis H Test, Z= Mann-Whitney U-Test; a, b, c= Significant difference according to Mann-Whitney U test with Bonferonni correction; p<0.05

patients with poor economic status compared to patients with moderate economic status (Z=-2.343; p=0.019) (Table 2).

The mean QL2 score was lower in patients who were diagnosed with stomach cancer, compared to patients who were diagnosed with rectal cancer (Z=-2.478; p=0.013) and patients who were diagnosed with colon cancer (Z=-4.496; p=0.000). The mean QL2 score was lower in patients in the other diagnosis group (esophageal, tongue, pancreatic, gallbladder, and liver cancers) compared to patients with colon cancer (Z=-2.066; p=0.039). The mean functional difficulties score was higher in patients with colon cancer, compared to patients with stomach cancer (Z=-3.315; p=0.001) and patients in the other diagnosis group (Z=-2.832; p=0.001). The mean symptoms score was higher in patients with stomach cancer (Z=-3.744; p=0.000) and patients with rectum cancer (Z=-2.776; p=0.005), compared to patients with colon cancer (Table 3).

The mean QL2 score was lower in patients with metastasis, compared to patients without metastasis (p=0.001). The mean functional difficulties score was

Table 3. The Mean EORTC QLQ and HAD Scores with Respect to Disease and Treatment Features

Features	EORTC QLQ-C30									
	QL2				Functional difficulties			Symptoms		
	n	Mean	SD	Test	Mean	SD	Test	Mean	SD	Test
Medical diagnosis										
Colon cancer	138	65.03[b,c]	23.28	X^2=22.172 p=0.000	75.45[a,b]	17.99	X^2=15.526 p=0.001	27.20[a,b]	18.42	X^2=18.702 p=0.000
Rectum cancer	75	58.77[a]	24.31		68.59	23.61		35.11[b]	20.57	
Stomach cancer	84	50.79[a,c]	22.54		67.48[a]	19.35		37.21[a]	20.59	
Other*	14	51.19[b]	25.70		60.15[b]	22.23		39.37	17.32	
Metastasis										
Yes	192	54.38	24.34	Z=-3.198 p=0.001	65.64	22.59	Z=-4.052 p=0.000	36.88	21.14	Z=-3.847 p=0.000
No	143	62.93	24.33		75.71	17.09		27.82	17.69	
Reason for hospital stay										
Supportive care **	60	39.72	24.22	Z=-6.131 p=0.000	54.74	25.59	Z=-5.410 p=0.000	48.88	22.05	Z=-6.120 p=0.000
Chemotherapy	274	62.25	22.66		73.34	18.27		29.47	18.05	
Knowledge about disease										
Yes	311	59.05	24.11	Z=-2.433 p=0.015	70.96	20.40	Z=-2.985 p=0.003	32.36	19.98	Z=-2.011 p=0.044
No	24	44.79	28.31		56.75	24.49		41.55	21.73	
Thoughts about disease										
Treatable	224	60.34	24.13	X^2=5.282 p=0.071	72.43[a]	19.85	X^2=9.429 p=0.009	30.40[b]	19.15	X^2=10.229 p=0.006
Untreatable	21	54.36	28.33		63.28	25.85		37.24	22.77	
Requires long-term treatment	90	53.14	24.56		65.30[a]	21.67		38.54[b]	21.12	

Features	HAD					
	Anxiety			Depression		
	Mean	SD	Test	Mean	SD	Test
Medical diagnosis						
Colon cancer	5.79	4.27	X^2=2.618	4.98[a]	4.27	X^2=16.571 p=0.001
Rectum cancer	6.98	5.68	p=0.454	6.82	5.33	
Stomach cancer	6.63	4.73		7.04[a]	4.48	
Other*	7.42	5.01		8.07	5.28	
Metastasis						
Yes	7.05	4.95	Z=-2.001	7.15	4.99	Z=-3.603
No	5.97	4.8	p=0.045	5.25	4.44	p=0.000
Reason for hospital stay						
Supportive care **	8.31	6.04	Z=-2.331	9.43	5.85	Z=-4.685
Chemo-therapy	6.2	4.56	p=0.019	5.64	4.33	p=0.000
Knowledge about disease						
Yes	6.38	4.81	Z=-2.680	6.12	4.74	Z=-2.768
No	9.29	5.54	p=0.007	9.16	5.48	p=0.006
Thoughts about disease						
Treatable	5.85[a,b]	4.56		5.32[a]	4.36	
Untreatable	8.38[b]	6.67		9.90[a]	6.05	X^2=30.302
Requires long-term treat-ment	8.01a	4.91	p=0.000	8.05	4.89	p=0.000

** Other = Esophageal cancer, tongue cancer, pancreatic cancer, gallbladder cancer, and liver cancer; ***Supportive care: Patients who receive supportive care for side effects (n=55), terminal patients (n=1), patients waiting for chemoembolization and similar treatments (n=4); X^2: Kruskal Wallis H Test, Z: Mann-Whitney U-Test; [a, b, c]: Significant difference according to Mann-Whitney U-test with Bonferonni correction; p< 0.05

higher in patients without metastasis, compared to patients with metastasis (p=0.000). The mean symptoms score was higher in patients with metastasis compared to patients without metastasis (p=0.000) (Table 3).

The mean QL2 score was lower in patients who received supportive care, compared to patients who received chemotherapy (Z=-6.131; p=0.000); on the other hand, the mean symptoms score was higher in these patients (Z=-6.120; p=0.000). Patients who were admitted to the hospital for chemotherapy had higher mean functional difficulties score compared to patients who would receive supportive care (Z=-5.410; p=0.000).

Patients who did not know their diagnosis had lower mean QL2 scores compared to patients who knew their diagnosis (Z=-2.433; p=0.015); on the other hand, patients who did not know their diagnosis had higher mean symptoms scores (Z=-2.011; p=0.044). The mean functional difficulties score was significantly higher in patients who knew about their disease, compared to patients who did not know about their disease (Z=-2.985; p=0.003). We did not find a significant difference in mean QL2 score with respect to patients' thoughts about their disease (p=0.071). On the other hand, the mean functional difficulties score was higher in patient who considered their disease to be curable, compared to patients who considered their disease to require long-term treatment (Z=-2.854; p=0.004). The mean symptoms score was higher in patients who thought that their disease required "long-term treatment", compared to patients who considered their disease as "treatable" (Z=-3.110; p=0.002) (Table 3).

We found a weak negative correlation between the number of hospital stay and mean functional difficulties score (r=-0.117, p=0.032). However, we did not find a significant correlation between the number of hospital stay and mean QL2 and mean symptoms score. There was a weak negative correlation between disease duration and the mean QL2 score (r=-0.123, p=0.025). We did not find a significant correlation between disease duration and mean functional difficulties score, and mean symptoms score.

HADS and EORTC QLQ C-30 correlation

We determined a negative correlation between the mean anxiety score and mean QL2 score (r=-0.380; p=0.000) and mean anxiety score and mean functional difficulties score (r=-0.605; p=0.000). On the other hand, there was a positive correlation between mean anxiety score and mean symptoms score (r=.490; p=0.000). We found a significant negative correlation between the mean depression score and the mean QL2 score (r=-0.454; p=0.000), and the mean functional difficulties score (r=-0.667; p=0.000). On the other hand, there was a significant positive correlation between the mean depression score and the mean symptoms score (r=0.602; p=0.000).

Discussion

HADS scores

We found that anxiety increased with decreasing age, whereas depression was not affected. Contrary to our findings, a study has shown that middle-aged and old patients with GI cancer have higher anxiety levels (Ozkan et al., 2007). However, similar to our study, another study has shown that age has no effect on depression levels (Tavoli et al., 2007). On the other hand, different studies have reported that elder patients have higher anxiety and depression levels (Nikbakhsh et al., 2014).

In our study, we found that female patients had higher anxiety and depression levels, compared to males. This could result from the common belief in society that women should have higher level of responsibilites. Similarly, different studies have also reported that female patients have higher anxiety levels compared to males (Atesci et al., 2003; Mystakidou et al., 2005; Dogar et al., 2009; Karabulutlu et al., 2010). In our study, we found that patients who were literate/elementary school graduate had higher anxiety levels compared to patients who were graduate/postgraduate. Patients who were literate/elementary school graduate had highest depression score. These findings suggest that patients with lower educational level may have more difficulty in acquiring knowledge, understanding given information, and coping with problems. Contrary to our study, different studies have reported that educational level has no effect on anxiety and depression levels (Ozkan et al., 2007; Tavoli et al., 2007).

In the present study, single/divorced patients had higher anxiety and depression levels compared to married patients. Similar to our study, Mystakidou et al. (2005) have found that individuals who are not married experience more anxiety compared to married individuals. On the other hand, some studies have reported that marital status has no effect on anxiety and depression levels (Ozkan et al., 2007; Tavoli et al., 2007).

Patients with GI cancer can experience depression as a result of the disease, as well as the new complications that arise due to different treatment methods (Bullen et al., 2012). In our study, we did not find a significant difference in anxiety levels with respect to diagnosis. On the other hand, patients who were diagnosed with stomach cancer had higher depression levels compared to patients who were diagnosed with colon cancer. Similarly, a study has emphasized that patients with stomach cancer have high anxiety and depression levels (Nikbakhsh et al., 2014). Other studies have reported that diagnosis has no effect on anxiety and depression levels (Matsushita et al., 2005; Tavoli et al., 2007).

In our study, patients with metastasis had higher anxiety and depression levels, compared to patients without metastasis. Previous studies have also reported similar results. For instance, it has been reported that patients with advanced disease/metastasis have higher anxiety and depression levels, compared to patients with local disease (Ozkan et al., 2007). Another study has shown that patients with late-stage disease have higher anxiety and depression levels compared to patients with early-stage disease (Matsushita et al., 2005). We found that patients who received supportive care had higher anxiety and depression levels, compared to patients who received chemotherapy. Similarly, a study has shown that terminal patients who receive chemotherapy as supportive care have significantly higher anxiety and depression levels (Nikbakhsh et al., 2014). Another study has reported that patients who receive chemotherapy or radiotherapy experience more anxiety compared to patients who receive only supportive care (Mystakidou et al., 2005). In our study, patients who did not know their diagnosis had higher anxiety and depression levels, compared to those who knew their diagnosis. We can speculate that the disease causes uncertainty in patients' lives, which in turn leads to stress and anxiety. Higher anxiety and depression levels in patients who do not know their diagnosis can occur due to patients being unable to make sense of what they experience. Contrary to our study, different studies have shown that patients who know their diagnosis have

higher incidence of psychiatric disorder (Atesci et al., 2003), and higher anxiety and depression levels (Tavoli et al., 2007).

Patients who thought that their disease required "long-term treatment" had higher anxiety and depression levels, compared to patients who considered their disease to be "treatable". Patients who considered their disease to be "untreatable" had higher depression levels, compared to patients who considered their disease to be "treatable". Thinking about the requirement for long-term treatment or considering the disease as untreatable can imply having difficulties for a long time and negative effects on future plans. Thus, having such notions can increase the anxiety and depression levels. Moreover, anxiety and depression levels can increase as a result of hopelessness and despair (Kavradım and Ozer, 2014).

In the present study, we found that anxiety levels decreased with increasing disease duration, whereas depression levels increased during the same period. On the contrary, a study has shown that both depression and anxiety levels increase with increasing disease duration (Nordin et al., 2001). Another study has shown that patients who have the disease < 1 year have higher anxiety and depression levels (Ozkan et al., 2007). According to another study, patients who have the disease > 1 year have higher anxiety and depression levels, compared to patients who have the disease < 1 year (Atesci et al., 2003). Matsushita et al. (2005) have found that the incidence of depression is higher in patients with longer hospital stay compared to patients with standard hospital stay.

EORTC QLQ C-30 scores

We did not find a correlation between age and life quality. Similar studies have also demonstrated that age has no effect on life quality (Dehkordi et al., 2009). Moreover et al. (2004) have shown that patients who are >60 years have higher functional difficulties, and their symptoms decrease with increasing age.

Our findings indicate that male patients experience more functional difficulties, whereas female patients experience more symptoms. A study on patients with rectal cancer has shown that male patients experience more functional difficulties and symptoms, compared to female patients (Unsal et al., 2006). A study on colorectal cancer patients has shown that female patients have lower life quality (Gray et al., 2011). Another study has shown that gender has no effect on life quality (Dehkordi et al., 2009). In the present study, we found that patients who were secondary school graduate/graduate/postgraduate experienced more functional difficulties compared to patients who were literate/elementary school graduate. Patients who were literate/elementary school graduate experienced more symptoms compared to patients who had higher education. The high level of functional difficulties in patients who have higher educational level can result from patients having high expectations and aims, and the fact that their disease prevents them from achieving these goals. The presence of more symptoms in patients with lower educational level implies that these patients experience more difficulty in terms of symptom management and acquiring information about their symptoms. A study has shown that patients with lower educational level experience more functional difficulties, compared to patients with higher educational level (Matsushita et al., 2005). Other studies have reported that educational level has no effect on life quality (Unsal et al., 2006; Dehkordi et al., 2009).

Our findings show that patients with poor economical status experience more symptoms compared to patients with moderate economical status. Similarly, Gray et al. (2011) have reported that patients with lower income have lower life quality. Contrary to the present study, a study has shown that economical status has no effect on life quality (Dehkordi et al., 2009).

In the present study, we found that patients with stomach cancer and patients in the other diagnosis group (esophageal, tongue, pancreatic, gallbladder and liver cancer) had poor general well-being. Moreover, we found that patients with colon cancer had higher level of functional difficulties. Patients with stomach or rectum cancer had higher symptoms. Different studies, contrary to the present study, have reported that cancer type has no effect on life quality (Sawada et al., 2009; van den Beuken-van Everdingen et al., 2009).

In our study, patients who had metastasis had poor overall condition, and these patients experienced more symptoms. On the other hand, patients who did not have metastasis experienced more functional difficulties. Similar to our study, another study has shown that patients with metastasis have lower life quality (Gray et al., 2011). In our study, patients who received supportive care had poor general well-being, and these patients experienced more symptoms. Patients who receive chemotherapy experience mostly functional difficulties. The facts that patients who receive supportive care have poor general well-being, and experience more symptoms can result from patients being in the terminal stage, having low blood counts, liver failure, infections, and diarrhea. In a similar study, patients who receive supportive care have lower life quality compared to patients who receive chemotherapy (van den Beuken-van Everdingen et al., 2009). While patients who know their diagnosis have poor general well-being, these patients experience less functional difficulties. Patients who do not know their diagnosis experience more symptoms compared to those who know their diagnosis. These findings can result from patients experiencing anxiety and stress. According to another study, patients who are not diagnosed have lower life quality, which is similar to our finding that patients who do not know their diagnosis have lower life quality (Gray et al., 2011). In our study, we found that patients' overal condition deteriorated with increasing disease duration, and functional difficulties increased with decreasing number of hospitalization. The increasing number of interventions during the course of the disease, as well as metastasis, can decrease the general well-being of the patients. The decreasing level of functional difficulties with increasing number of hospital stays can be related to patients receiving support during their hospital stay. Similar to our study, another study has shown that patients with a shorter follow-up period had better life quality (Unsal et al., 2006). On the other hand, it has been

reported that disease duration has no effect on life quality (Dehkordi et al., 2009).

Correlation between HADS and EORTC QLQ C-30

Our findings show that higher anxiety and depression levels lead to more symptoms, decreased general well-being and decreased level of functional difficulties. In other words, life quality decreases with increasing anxiety and depression. A similar study has shown that patients who have anxiety and depression have lower life quality (van den Beuken-van Everdingen et al., 2009). Anxiety and depression increase the frequency of potential symptoms throughout the treatment period, and have a negative effect on life quality.

In conclusion, Patients who are diagnosed with stomach cancer, who have metastasis, who receive radiotherapy or supportive care, and who do not know about their disease should be followed up and evaluated for their general well-being. Patients who are male, who are secondary school graduate/graduate/postgraduate, who are diagnosed with colon cancer, who know about their disease, who consider their disease to be "treatable" should be followed up and evaluated for functional difficulties. Patients who are female, literate/elementary school graduate, who have poor economical status, who have metastasis, who receive radiotherapy or supportive care, who do not know about their disease, and who think that their disease requires "long-term treatment" should be followed up for their symptoms, and should be consulted to units where they can receive support.

Being female, literate/elementary school graduate, single/widowed/divorced, having stomach cancer, metastasis; receiving supportive care; not knowing diagnosis; considering the disease as "untreatable" constitute risk factors with respect to anxiety and depression. On the other hand, anxiety and depression decrease life quality. The patients should be supported to prevent anxiety and depression, and should be followed up.

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