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ORIGINAL ARTICLE

The Association of Death Anxiety, Loneliness, and Hopelessness with Clinical Features and Qualityof Life in Palliative Radiotherapy Patients

Zümrüt Arda KAYMAK,[1] Gülin ÖZDAMAR ÜNAL,[2] Emine Elif ÖZKAN[1]

[1]Department of Radiation Oncology, Süleyman Demirel University Faculty of Medicine, Isparta-*Türkiye*
[2]Department of Psychiatry, Süleyman Demirel University Faculty of Medicine, Isparta-*Türkiye*

OBJECTIVE

The incidence of adjustment disorder, anxiety, and depression in cancer patients is 40–50%. These disorders may lead to an impairment in quality of life (QoL). Radiotherapy is an essential part of palliative care that relieves symptoms in advanced cancer patients. The cancer patients may have the opportunity to be evaluated regarding psychosocial morbidity in radiation oncology departments (RODs).

METHODS

Advanced cancer patients treated in ROD in palliative intent were asked to fill out Templer's death anxiety scale, Beck hopelessness scale, University of California, Los Angeles loneliness scale, and short-form 36. The correlations of scale results with each other and with sociodemographic and clinical characteristics of patients were investigated statistically.

RESULTS

Forty patients' results were evaluated in the study. The rate of high death anxiety was 45%, moderate hopelessness 27.5%, mild hopelessness 32.5%, moderate loneliness 57.5%, and high loneliness 15%. There were negative significant correlations between physical functioning and loneliness, physical role limitations and death anxiety/loneliness, social functioning and death anxiety/loneliness, energy/fatigue and hopelessness/loneliness, bodily pain and hopelessness, general health perceptions/emotional well-being, and all three moods. The identified predisposing factors for death anxiety were male gender (p=0.030) and poor ECOG performance status (p=0.034). Higher educational attainment was associated with higher loneliness (p=0.026). Body mass index was negatively correlated with higher levels of death anxiety, loneliness, and hopelessness (p=0.007, 0.025, and 0.020).

CONCLUSION

Even more than 50% of the patients who underwent palliative radiotherapy suffer from hopelessness, loneliness, and death anxiety. This circumstance is related to poorer QoL. Advanced cancer patients must be evaluated about psychological symptoms and supported if needed to improve QoL.

Keywords: Body mass index; death anxiety; hopelessness; loneliness; palliative radiotherapy; quality of life.

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Dr. Zümrüt Arda KAYMAK
Süleyman Demirel Üniversitesi Hastanesi,
Radyasyon Onkolojisi Anabilim Dalı,
Isparta-Türkiye
E-mail: ardakaymak84@yahoo.com

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Introduction

Palliative radiotherapy (RT) has been utilized as an effective and standard treatment modality to reduce symptoms for locally advanced and metastatic cancer disease since the 1900s. Palliative RT provides pain relief, hemostasis for bleeding tumoral lesions, amelioration of obstructive symptoms, or recovery of neurological symptoms due to tumors in any site of the body.[1] Various recent studies have focused on patients with incurable cancer who have palliative RT in their final months.[2–4]

The previous studies reported the incidence of adjustment disorder, anxiety, and depression in cancer patients as 40–50%.[5–7] These disorders may cause social isolation, treatment compliance disorder, long rehabilitation period, suicide risk, impairment in quality of life (QoL), and even shorter survival in oncology patients.[8,9] Thus, the evaluation of patients in terms of any psychosocial morbidity should be a step of palliative care that should not be missed.

Negative expectations about something important and an inability to change the likelihood of that outcome bring out feelings of helplessness and hopelessness. Patients diagnosed with cancer may experience these emotions severely due to the disease's unpredictable nature. In addition, these patients often suffer from increased pessimism while they lose their ability to look ahead due to the uncertainty of their future.

Hopelessness is a common psychological symptom in cancer patients, such as depression and impaired QoL.[10,11] Cancer patients with depression and high hopelessness have an increased risk of suicide.[12,13]

Although death is an inevitable reality, it is denied by many people. Cancer patients who are faced with came up against the disease and treatment processes can focus on death. Death anxiety is a state of worry and panic that arise as a consequence of expectancy of death and a sense of regret for not being able to accomplish objectives.[14] Advanced stage cancer patients may have distressed thoughts about death, fear of death, and suffering among these patients may be as high as 80%.[15] Psycho-oncologists have defined the situation of patients who are aware of the deterioration in their health status while trying to arrest of their lives in the best possible way as "double awareness."[16]

Loneliness is an essential part of QoL and is defined as "an unpleasant experience that occurs when a person's network of relationships is felt to be deficient in some important way."[17] Although social isolation and loneliness are thought to be related, they are separate concepts.[18] A socially isolated person may not feel lonely, or someone with adequate social support may still feel lonely. Social isolation can be defined as a lack of relationships; however, loneliness is a subjective and negative experience.[19]

This study aimed to investigate death anxiety, hopelessness, and loneliness levels of distant metastatic cancer patients who underwent palliative RT in the radiation oncology department (ROD). The relation between QoL and death anxiety, hopelessness, and loneliness levels was also evaluated. In addition, possible predisposing characteristics of patients for high levels of death anxiety, hopelessness, and loneliness were investigated.

Materials and Methods

Study Population

The target population of this study was the cancer patients who are suffering from distant metastatic malignancies and who received treatment in a palliative intent in the ROD of our institute. Among these patients, the ones with performance status of ECOG 0-3 and literate were offered to participate in this study. Informed consent was obtained from all participants. All patients were receiving palliative RT targeting primary tumor site or metastatic lesions due to pain, bleeding, or compression symptoms. RT was delivered with 6-18 MV X-rays, using three-dimensional conformal RT technique, in 10 fractions, to a total dose of 30 Gy. In addition to age, gender, education, marital status, housing, and caregiver information, clinical data such as primary site, stage, date of diagnosis, previous treatments, and current height-weight information of each patient were recorded on a special follow-up form by the radiation oncologist.

Scales

The scales are provided printed for each patient, and they were allowed to fill out the forms in a sufficient time. A psychiatrist from our institute assessed the filled scales.

The Medical Outcomes Study 36-Item Short-Form (SF-36)

It is a health screening form widely utilizing for evaluating QoL in clinical practice and research. It was developed in 1992,[20] and the validity and reliability of the Turkish version of SF-36 were studied by Kocyigit

et al.[21] The form consists of eight health concepts: Physical functioning (10 items), bodily pain (2 items), role limitations due to physical health problems (4 items), role limitations due to personal or emotional problems (4 items), emotional well-being (5 items), social functioning (2 items), energy/fatigue (4 items), and general health perceptions (5 items). Scores for each domain range from 0 to 100; the lowest score represents the worst health condition.

Templer's Death Anxiety Scale (TDS)
There are 15 questions answered as "yes" or "no" in the form. It was developed in 1970.[22] Scores of 7 and above indicate death anxiety. The validity and reliability of the Turkish version of TDS were reported by Ertufan.[23]

Beck Hopelessness Scale (BHS)
It is a 20-item, true or false questionnaire designed to quantify hopes for the future.[24] The validity and reliability of the Turkish version of BHS were studied by Seber et al.[25] The BHS scores range from 0 to 20, and higher scores indicate greater levels of hopelessness which is categorized as minimal (0-3), mild (4-8), moderate (9-14), and severe (≥15).

University of California, Los Angeles Loneliness Scale (ULS)
It has a 4-point Likert-type rating with a total of 20 items and was developed by Russell et al. in 1980.[26] The validity and reliability of the Turkish version of ULS were studied by Demir.[27] Scores are categorized as low (20-34), moderate (35-48), and high (≥49). Higher scores indicating higher levels of loneliness.

Statistical Analysis and Ethical Considerations
The categorical characteristics of the patients were presented with numbers and percentages, whereas the continuous characteristics were presented with median (minimum-maximum) due to the non-parametric distribution. The scale scores were evaluated with Kolmogorov-Smirnov and Shapiro-Wilk normality tests and presented with mean±standard deviation. The correlations between scale scores in each other and other continuous variables were evaluated with the Pearson test. The score means were compared with independent samples t-test between two groups. The median scores in the three groups were compared with the Kruskal-Wallis test. An overall 5% type-I error level was used to infer statistical significance.

The protocol of the present study was reviewed and approved by the Institutional Human Research Ethics Committee (protocol no.: 379-23/12/2019). All procedures were performed in terms of the ethical standards of the Institutional Research Committee in alliance with the 1964 Helsinki Declaration and its later amendments.

RESULTS

Patient Characteristics
Thirty-three (82.5%) male and 7 (17.5%) female patients were involved in the study. The median age of all patients was 60 (43-87). More than half of the patients (52.5%) were diagnosed with lung cancer. Sixteen (40%) patients did not have metastatic disease at the time of diagnosis, but then with a progressive disease, all had at least one metastatic site at the time of the study. Ten (25%) patients were treatment naïve when they were consulted for palliative RT. Between diagnosis and palliative RT, the median time was 9.6 (0.26-72.57) months. The sites that were treated with palliative RT were 18 (45%) bone metastasis, 14 (35%) brain metastasis, 7 (17.5%) lung tumor, and 1(2.5%) rectum tumor. The sociodemographic features (marital status, number of kids, educational status, housing, and caregiver), BMI, performance status, chronic disease, or psychiatric drug use information of all patients are given in Table 1. The BMI profiles of the patients were as follows: 3 (7.5%) patients under 20, 19 (47.5%) patients between 20 and 24.9, 11 (27.5%) patients between 25 and 29.9, and 7 (17.5%) patients over or equal to 30.

Scale Results
The mean scores of SF-36, TDS, BHS, and ULS are shown in Table 2. Eighteen (45%) patients had a high death anxiety score (≥7). According to BHS, 11(27.5%) patients had moderate, and 13 (32.5%) patients had mild hopelessness where no patients with severe scores were recorded. More than half of the patients (57.5%) had moderate and 6 (15%) patients had high ULS scores.

We evaluated the relations of SF-36 results with TDS, ULS, and BHS. Remarkable correlations were detected, which are shown in detail in Table 3. TDS, BHS, and ULS scores were positively correlated with each other which was statistically significant ($p=0.006$, $p=0.001$, and $p<0.001$). All of the scale scores were negatively correlated with emotional well-being ($p=0.001$ and $p<0.001$) and general health perceptions ($p=0.038$

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Table 1 The sociodemographic and clinical characteristics of the patients

	Number	Percentage
Gender		
Male	33	82.5
Female	7	17.5
Marital status		
Married	33	82.5
Single	7	17.5
Education		
Primary school	27	67.5
High school	9	22.5
College	4	10
Housing		
Self-house	36	90
Relatives' house /nursery	4	10
Caregiver		
Self-care	3	7.5
Partner	30	75
Children	4	10
Relative	3	7.5
Site of primary tumor		
Prostate	6	15
Lung	21	52.5
Colorectal	4	10
Bladder	4	10
Breast	3	7.5
Over	1	2.5
Previous treatments		
Chemotherapy	4	10
Surgery	5	15.5
Multimodal	19	47.5
None	10	25
Site of palliative RT		
Primary tumor	7	17.5
Metastatic site	33	82.5
Stage at the diagnosis		
I–III	16	40
IV	24	60
ECOG performance status		
1	10	25
2	18	45
3	12	30
Other chronic disease		
Yes	19	47.5
No	21	52.5
Psychiatric drug use		
Yes	3	7.5
No	37	92.5
	Median	**Range**
Age	60	43–87
Number of children	2	0–6
Time between diagnosis and palliative RT (months)	9.16	0.26–72.57
Body mass index	24.45	16.2–36

RT: Radiotherapy; ECOG: Eastern Cooperative Oncology Group.

Table 2 The mean scores of short-form 36 sub-concepts, Templer's Death Anxiety Scale, Beck Hopelessness Scale, and UCLA Loneliness Scale

	Mean score	SD
Short-form 36		
Physical functioning	59.63	±28.04
Role limitations due to physical health problems	38.13	±35.35
Social functioning	59.43	±26.39
Role limitations due to personal or emotional problems	39.99	±33.95
Energy/fatigue	49.25	±22.77
General health perceptions	50.63	±24.6
Bodily pain	41.3	±27.45
Emotional well-being	61.2	±21.66
Templer's death anxiety	6.92	±3.91
Beck hopelessness scale	5.44	±4.31
UCLA loneliness scale	39.1	±9.47

UCLA: University of California, Los Angeles; SD: Standard deviation.

and p<0.001) which were also statistically significant. Only the ULS score was negatively correlated with physical functioning (p=0.007). TDS and ULS scores were negatively correlated with role limitations due to physical health problems (p=0.039 and p=0.035) and social functioning (p=0.015 and p=0.043). BHS and ULS scores were negatively correlated with energy/fatigue level (p<0.001 and p=0.001). Only BHS score was negatively correlated with bodily pain level (p=0.010).

A statistically significant positive correlation was detected between educational status and ULS score (correlation coefficient=0.351, p=0.026). The median scores of ULS for primary school, high school, and college graduated patients were 38 (20-57), 43 (26-55), and 46 (45-55), respectively (p=0.046) (Fig. 1a).

The mean TDS scores were statistically significantly different between male and female patients. It was higher in male patients (7.42±3.88 vs. 4.43±2.87, p=0.030). Furthermore, the median TDS scores was higher in the ECOG 3 group (p=0.034) (Fig. 1b, c). The median TDS scores of ECOG 1, 2, and 3 patients were 6 (4-14), 4.5 (1-11), and 9.5 (3-15).

BMI was the only clinical feature with a statistically significant negative correlation with TDS, BHS, and ULS scores (p=0.007, p=0.025, and p=0.020). As a result of the comparison of scale scores between patients whose BMI <26 and ≥26, higher TDS, BHS, and ULS scores were observed in the BMI <26 group (p=0.046, p=0.033, and p=0.024) (Table 4).

Table 3 The correlations between TDS, BHS, ULS, SF-36 scores, and continuous variables of the patients

	TDS score	BHS score	ULS score
Physical functioning	-0.153	-0.180	**-0.428**
	0.347	0.267	**0.007**
Role limitations due to physical health problems	**-0.328**	-0.138	**-0.339**
	0.039	0.397	**0.035**
Social functioning	**-0.32**	-0.299	**-0.326**
	0.015	0.061	**0.043**
Role limitations due to personal or emotional problems	-0.242	-0.037	-0.313
	0.132	0.820	0.052
Energy/fatigue	-0.238	**-0.529**	**-0.497**
	0.139	**<0001**	**0.001**
General health perceptions	**-0.329**	**-0.601**	**-0.560**
	0.038	**<0.001**	**<0.001**
Bodily pain	-0.158	**-0.405**	-0.313
	0.330	**0.010**	0.052
Emotional well-being	**-0.525**	**-0.593**	**-0.522**
	0. 001	**<0.001**	**0.001**
Age	0.070	0.247	0.151
	0.668	0.125	0.360
Body mass index	**-0.418**	**-0.355**	**-0.371**
	0.007	**0.025**	**0.020**
Time between diagnosis and palliative RT	0.056	0.100	-0.034
	0.731	0.538	0.838
Number of children	-0.013	0.020	-0.053
	0.936	0.902	0.749
TDS score	–	**0.428**	**0.565**
		0.006	**<0.001**
BHS score	**0.428**	–	**0.524**
	0.006		**0.001**
ULS score	**0.565**	**0.524**	–
	<0.001	**0.001**	

Correlations were evaluated by Pearson correlation test. The correlation coefficient is in the first line, the p value is in the second line. Statistically significant values are bold. TDS: Templer's death anxiety scale; BHS: Beck Hopelessness Scale; ULS: UCLA Loneliness Scale; SF-36: Short-form 36; RT: Radiotherapy.

DISCUSSION

A total of 40 advanced cancer patients' data were evaluated in the present study. About 45% of patients had high death anxiety, 27.5% had moderate hopelessness, 32.5% had mild hopelessness, 57.5% had moderate loneliness, and 15% had high loneliness. Increasing death anxiety, hopelessness, and loneliness were all associated with poorer QoL. The predisposing factors of death anxiety were male gender and poor ECOG performance status, while higher education level was the only factor related to loneliness. The negative correlation of BMI with all scores was remarkable. BMI was not investigated as a factor in previous similar studies to the best of our knowledge.

Through the current multimodal treatment methods, it has become possible to achieve extended survival times in metastatic cancer patients. With prolonged survival, the QoL of patients becomes an even more remarkable issue. The median overall survival (mOS) varies according to the primary cancer site. While the mOS was reported up to 57 months for metastatic prostate cancer and 41.8 months for breast cancer, it is limited to 30 months for lung and colorectal cancers.[28-31] The majority of the patients in the present study were lung, prostate, and colorectal cancer patients.

In a meta-analysis,[32] 13 studies that evaluate loneliness among cancer patients by ULS were reviewed, and the mean score was reported as 38.26, corresponding to moderate loneliness, which was in line with our result (39.1). This meta-analysis also argued that the level of loneliness increased over time af-

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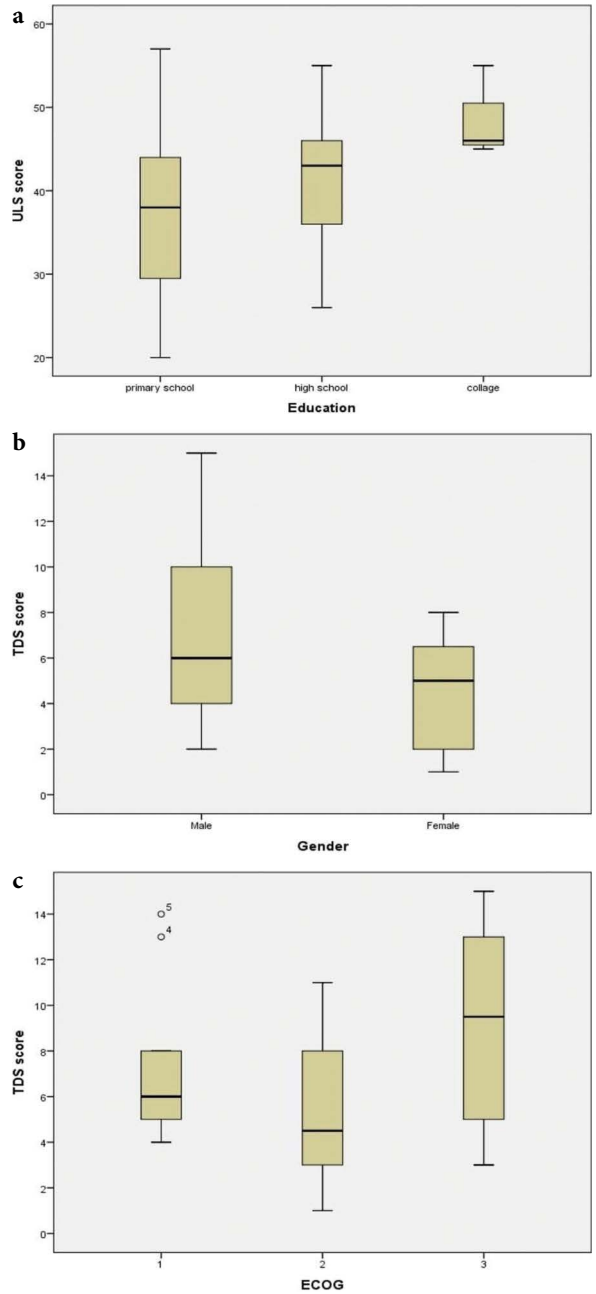

Fig. 1. (a) UCLA loneliness scale (ULS) box plot for education level. The median scores of ULS for primary school, high school, and college graduated patients were 38 (20-57), 43 (26-55), and 46 (45-55), respectively (p=0.046). (b) Templer's death anxiety scale (TDS) box plot for gender. The mean TDS scores of males are 7.42±3.88 and of females are 4.43±2.87 (p=0.030). (c) TDS box plot for ECOG performance status. The median TDS scores of ECOG 1, 2, and 3 patients were 6 (4-14), 4.5 (1-11), and 9.5 (3-15) (p=0.034).
ECOG: Eastern Cooperative Oncology Group.

Table 4 The comparison of scale results of patients with body mass index below and above 26

	BMI<26 (n=24)	BMI≥26 (n=16)	p
TDS score	7.83±4.14	5.5±3.01	**0.046**
BHS score	6.63±3.7	3.56±4.5	**0.033**
ULS score	41.75±7.74	35.38±10.5	**0.024**

The means of the groups are compared by independent samples t-test. BMI: Body mass index; TDS: Templer's death anxiety scale; BHS: Beck hopelessness scale; ULS: UCLA loneliness scale.

ter cancer diagnosis and that the lack of social support was associated with loneliness.[32] On the contrary, our results did not reveal any relationship between the time from diagnosis and the level of loneliness. This result may be attributed to the target population in the meta-analysis, which includes all stages unlike our study evaluating only metastatic patients treated with palliative intent. The only variable we found to have a statistically significant association with loneliness in the present study was educational attainment in the present study. Similarly, Avci and Kumcagiz[33] also detected that the level of loneliness increased with the increase in education level in their study with breast cancer patients, although this was not statistically significant (p=0.085). In the study of Boer et al.,[34] in which they evaluated the link between QoL and loneliness in cancer patients, social functioning, emotional limitations, mental health, and vitality were found significantly related to loneliness level (p<0.001 for all). These results were in line with our study. The additional correlation of physical functioning, physical limitations, and general health with the ULS score in the present study can be attributed to the sample consisting of metastatic patients only.

The present study's findings indicated that individuals diagnosed with various forms of cancer, most of whom were men, experienced more death anxiety. The fact that the majority of our sample was composed of men may have contributed to this finding. Other studies from Eastern countries have revealed that women experience more death anxiety than males among cancer patients.[35,36] However, it is also reported that men are more likely to contemplate death than women.[37] According to a meta-analysis encompassing 22 studies and 2474 individuals, the estimated pooled mean for death anxiety in cancer patients was 6.84 (CI 95%: 5.98, 7.69). It has been shown that the type of cancer, gender, marital status, and geographic location all influence death fear. Death anxiety rates vary accord-

ing to cultural norms, religiosity, an individual's access to medical care, and regional disparities in health systems.[38] Similar to our study, a study investigating the relationship between death anxiety and QoL in advanced cancer patients was reported from Canada. The study evaluated death anxiety by the Death and Dying Distress Scale, which they developed, and social, functional, physical, and emotional well-being by the 46-item Functional Assessment of Chronic Illness Therapy-Palliative Care scale. They found that functional, physical, and emotional well-being were negatively correlated with death anxiety.[39]

In some prior research, hopelessness was associated with an increased risk of incidence and mortality of serious illnesses such as myocardial infarction and cancer.[40] There is a study with a 10-year follow-up period reporting that helplessness and hopelessness are effective in disease-free survival in patients with breast cancer.[41] Gustavsson-Lilius et al. found considerable gender differences in their study of 155 cancer patients in which they investigated the effects of optimism, hopelessness, and partner support on QoL. Female patients' optimistic assessments were connected with high levels of partner support, and together they predicted improved QoL. For male patients, a low level of hopelessness was the primary predictor of good QoL.[42] In our study, hopelessness levels did not differ between genders or according to other sociodemographic features. The hopelessness level was lower only in patients with BMI <26. The effect of hopelessness on QoL was demonstrated by its negative correlation with energy/fatigue, general health perceptions, bodily pain, and emotional well-being scores.

Another remarkable finding of our study was that individuals with a lower BMI were more likely to suffer from death anxiety, hopelessness, and loneliness. Just a few research studies examine the psychological distress experienced by cancer patients who have a low BMI. Weight loss in cancer patients may occur due to the clinical course of the disease, treatment side effects, as well as psychological distress. In addition, low BMI in individuals with advanced cancer may predispose them to psychological problems. Negative feelings about body image may serve as a reminder to cancer patients of their impending demise. The perceived threat can trigger fear reactions. Cachexia is connected with increased despair and anxiety, as well as a worse QoL among cancer patients.[43,44]

Symptom control may occur weeks to months after the completion of palliative RT. Thus, patients who will be offered palliative RT should be carefully selected. Considering the side effects of RT, palliative RT may not be indicated in patients with poor performance, whose informed consent cannot be obtained, and transportation is not possible, who have multiple progressive diseases, and who have a short life expectancy.[45] In the light of these criteria, patients with a performance status of ECOG 0-3 and literate patients were included in our study. The results indicated that the patients with ECOG 3 performance status had higher levels of death anxiety than ECOG 0-2 patients.

In advanced cancer patients, sociodemographic characteristics and psychological characteristics of the patient may predispose to hopelessness, depression, the desire for hastened death, and physical distress due to the disease. Patients requiring particular intervention can be identified by evaluating the patient in terms of these factors. The stress chain can be prevented by interventions to protect the sense of meaning and hope in these individuals and strengthen their self-esteem.[12,46-48]

When assessing the results of our study, it should be considered that this is a single-center study with a limited number of patients. If it had been planned as a multicenter study, it would have been considered that regional sociocultural features might not have affected the results.

CONCLUSION

More than half of the palliative RT patients suffer from hopelessness, loneliness, and death anxiety. This circumstance is related to poorer QoL. The levels of hopelessness, loneliness, and death anxiety were statistically significantly higher in patients with BMI <26. Advanced cancer patients must be evaluated about psychological symptoms and supported if needed to improve QoL and palliative care.

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Conflict of Interest: All authors declared no conflict of interest.

Ethics Committee Approval: The study was approved by the Süleyman Demirel University Faculty of Medicine Clinical Research Ethics Committee (No: 379, Date: 23/12/2019).

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