Association between suicidal ideation and behavior, and depression, anxiety, and perceived social support in cancer patients

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Background: The aim of this study was to determine the relationship between suicidal behavior and associated factors such as depression, anxiety, and perceived social support level in cancer patients.

Material/Methods: The study group included 102 patients who were under treatment in the oncology department and the control group included 100 individuals with similar sociodemographic features. A sociodemographic information form, Beck depression inventory, Beck anxiety inventory, suicidal behavior inventory, suicidal ideation inventory, and multidimensional inventory of perceived social support were used.

Results: The mean Beck depression inventory and Beck anxiety inventory scores in the study group were significantly higher compared to the control group. Thirteen patients in the study group attempted suicide, whereas 3 individuals attempted suicide in the control group. Similarly, the mean suicide behavior and ideation scores in the study group were significantly higher compared to the control group. The mean total multidimensional inventories of perceived social support score, as well as the mean family and friend sub-inventory scores in the control group were significantly higher compared to the study group.

Conclusions: This study revealed that depression and anxiety occur frequently in cancer patients. Suicide attempts and ideation are higher in cancer patients compared to the control group. Social support perceived from family and friends is lower in cancer patients. Suicide attempts are correlated with depression, anxiety, low level of perceived social support, and advanced disease stage.

MeSH Keywords: Suicide • Anxiety Disorders • Social Support • Cancer • Depression

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Background

Cancer is a complicated disease that mostly results in death unless diagnosed and treated at an early stage. It has physical, emotional, social, and economic effects on patients and their families. In developed countries, one-fourth of all deaths are due to cancer [1]. Cancer creates a crisis period in the lives of the affected individuals, and it is accompanied by serious existential problems. Following diagnosis with a terminal disease such as cancer, terminal patients' psychological reactions are defined as "denial, anger, negotiation, depression, and acceptance" [2]. During the process, the patient accepts reality, harmonizes physical and emotional energy, and participates with hope in the treatment. The psychological factors such as disease type, premorbid adjustment ability of the patient, possibility of physical and emotional rehabilitation, personality traits, coping strategies, cultural and religious beliefs, and social support are the effective factors in the management of this crisis period [3].

The incidence of psychiatric disorders in cancer patients has been reported to range between 9–60%, with a mean incidence of 30–40%. This is a considerably higher incidence compared to the 20–40% range reported for medical patients [4,5]. It has been reported that 90% of cancer patients with a comorbid psychiatric disorder developed the psychiatric disorder as a reaction to the disease or the treatment; 10% of the patients had the psychiatric disorder prior to the disease, in the form of personality or anxiety disorders [4,6]. Comorbid psychopathologies greatly influence patients' quality of life, self-care, adaptation to the treatment, and clinical process. Studies on psychiatric morbidity in cancer patients indicate that 50% develop psychiatric syndromes that require treatment at any stage of the diagnosis, treatment, and course. It is claimed that medical staff are not attentive enough to psychiatric disorders for various reasons; therefore, these disorders are not diagnosed and treated sufficiently, although most of these psychiatric diseases are treatable [3,7,8]. Major psychiatric disorders in cancer patients are adjustment disorders, anxiety disorders, depressive syndromes, organic brain syndromes (delirium, dementia, and other organic psychiatric syndromes, as well as neuropsychiatric adverse effects of chemotherapeutic agents), personality disorders, pain syndromes comorbid with psychiatric syndromes, anorexia, nausea-vomiting (related to chemotherapy), and other psychiatric syndromes [3,5,7–9]. Depressive syndrome is the most common psychiatric disorder in cancer patients. At one end of this range lies the expected sorrowful reaction, while adjustment disorder with depressive character and major depression lies on the other end. Psychiatric disorder history, low self-esteem, high emotional stress, and low social support during the diagnosis are the primary risk factors for depression in cancer patients. The other risk factors are alcohol addiction, advanced cancer, insufficient pain

control, other comorbid physical diseases, and using chemotherapeutic agents that cause depression. Furthermore, tumors that secrete hormones, pancreatic head cancer, central nervous system tumors, uremia, encephalitis, and electrolyte imbalance are the other major potential factors for depression [3–5,10]. Acute anxiety attacks are frequently seen in cancer patients during the stage of diagnosis, while waiting for examination results, prior to a new treatment, during changes in treatment, in the presence of a symptom/finding, in the presence of relapse, or when feeling changes related to a disease. Acute stress disorder, post-traumatic stress disorder, common anxiety disorder, panic disorder, and anxiety disorder due to general medical condition and chemotherapeutic agents are frequent anxiety disorders [3,8,9].

Suicide is a significant public health problem, which increases morbidity and mortality and leads to serious economic outcomes [11]. The association between suicide and cancer is understudied and is neglected by clinicians. Various studies have reported that the diagnosis of cancer is a risk factor for suicide. According to population-based cancer studies, suicide risk in cancer patients is 1.3–2.6-fold (2-fold on average) higher compared to the general population [12–14]. This risk is highest during the early stages after diagnosis, but various studies have shown that the risk continues to increase in the 30 years after breast cancer diagnosis. Furthermore, suicidal ideation and attempts were also reported to be frequent in childhood cancers 20 years after the treatment. Several studies have reported that early age at the time of diagnosis, cranial radiotherapy, preventing growth (an old treatment method for leukemia), physical disfiguration, deterioration in memory and cognitive functions, despair and depression, poor physical condition (especially uncontrolled pain), alcohol use, previous suicide attempts, and advanced age (especially over 60 years) are the factors related to suicide during the first year following cancer diagnosis [12–17]. Survivors have problems such as facing late effects like chronic pain, possible infertility, heart problems, loss of cognitive ability, and living with parents for a long time [3,17]. In a review of 677 articles, Robson et al. suggested that both completed suicide and suicidal ideation are higher in cancer patients compared to the general population [18]. Tokgöz et al. suggested that 11% of the patients had suicidal ideation. Moreover, advanced stage of the disease, poor prognosis, mild delirium causing uncontrolled impulses, inadequately controlled pain, depression, pre-existing psychiatric or personality disorders, physical and emotional exhaustion, and desocialization increase the risk of suicide [3,5,20].

Social support is generally defined as the physical and psychological assistance provided by family, friends, neighbors, and institutions to an individual facing a difficult situation. Social support meets an individual's basic social needs such as love, commitment, embracement, self-respect, and belonging to a

group. It has a positive impact on physical and mental health. However, researchers state that the people and institutions forming the social network of the individual are not always positive or supportive, can sometimes be a stressor in itself by having a negative impact, and can hinder other forms of support; therefore, it is emphasized that support that is felt or perceived by the individual rather than the social network provides a positive contribution for the individual [21–23]. In the case of disease, every individual needs increased social support. In particular, this need becomes more evident in a complicated disease such as cancer, which mostly results in death unless diagnosed and treated early, and influences the patient and the family physically, emotionally, socially, and economically. It may also closely affect the course of the disease and comorbid psychopathologies.

The present study aimed to investigate suicidal ideation and behavior in cancer patients followed up at the Denizli State Hospital Oncology Department, to investigate depression and anxiety levels, as well as the relationships between perceived social support and disease factors.

Material and Methods

The study group was selected from cancer patients who were consecutively admitted to Denizli State Hospital Oncology Department between May 2011 and May 2012, and who received ambulatory treatment. Denizli State Hospital Oncology Department is in southwest Turkey and serves approximately 2 million patients from Denizli and neighbor cities. The profile of these hospital patients represents the general population.

Patients who were illiterate, below the age of 18 years, refused evaluation, in the terminal period, and with cognitive deficits (orientation and memory deficits) were excluded from the study. The study was approved by the local ethics committee, and all participants provided written informed consent. The patients were informed about the study; none of the patients refused to participate in the study, but the tests of 3 patients were regarded as invalid due to insufficient answers. In total, there were 102 patients in the study group. Each patient was evaluated by psychiatrists and the study material was applied at the admission. Finally, patients who required psychiatric treatment were directed to the psychiatry department to plan their treatment. The control group consisted of 100 volunteers whose demographic characteristics were suitable for the study, who had no severe chronic physical diseases and no history of mental disorders, who were not related to the patients in the study group, and were willing to participate in the study. The control group was chosen from general internal medicine clinic visitors matched for age and gender.

Inventories used in the study

1. Sociodemographic Data and Information Collection Form: The sociodemographic data and information collection form was prepared by researchers and includes items on sociodemographic features of the patients (age, gender, educational level, marital status, profession, and economic status), data related to the disease (diagnosis, stage, type of treatment, and time since diagnosis), pre-existing diagnosis of a psychiatric disease and history of treatment (if available), history of suicide attempts (yes/no, number and method of the attempts, after or before cancer diagnosis, for life for volunteers), and with whom they live.

2. Suicidal Behavior Inventory: The Suicidal behavior inventory was developed by Linehan and Nielsen in 1981 and consists of 4 questions. It is a Likert-type inventory that investigates the suicide plan and attempt, suicidal ideation, suicide threat, and repeatability of suicide. The lowest score of the suicidal behavior inventory is 0 and the highest score is 14. The severity of suicidal behavior increases as the score increases [24].

3. Suicidal Ideation Inventory: The Suicidal ideation inventory is a semi-structured inventory that was developed by Beck et al. in 1979 and consists of 19 questions. Each question is graded 0–2; a higher score represents severe suicidal ideation [25].

4. Beck Anxiety Inventory (BAI): The Beck anxiety inventory is a 4-point Likert-type scale self-report inventory developed by Beck to measure the frequency of anxiety symptoms [26]. The total score of the inventory ranges from 0 to 63. Thirteen questions evaluate physiological symptoms, 5 questions evaluate comprehension, and 3 questions evaluate somatic and comprehension symptoms. In the present study, the Beck Anxiety Inventory cut-off was 16.

5. Beck Depression Inventory (BDI): The Beck depression inventory is a 4-point Likert-type scale self-report inventory developed by Beck to determine the risk of depression and to measure the level of depressive symptoms. The total score of the inventory ranges from 0 to 63 [27].

6. Multidimensional Scale of Perceived Social Support (MSPSS): The multidimensional scale of perceived social support was developed by Zimmet et al. in 1988 and it is used to measure perceived social support factors of the individual. The scale, which consists of 12 questions, is a 7-point (1–7 points) Likert-type scale that ranges from "strongly disagree" to "strongly agree". The scale has 3 subscales consisting of 4 questions to measure family, friend, and significant other support. The lowest score of the subscales is 4 and the highest score is 28. The lowest score of the complete scale is 12 and the highest score is 84. A high score represents high perceived social support [28].

Table 1. Sociodemographic features of the study and control groups.

	Study (n=102)		Control (n=100)		p
Age	53.73±12.46		51.02±12.803		>0.05
Gender	Female	58	Female	60	>0.05
	Male	44	Male	40	
Marital Status	Single	2	Single	1	>0.05
	Married	86	Married	82	
	Widow/divorcee	14	Widow/divorcee	17	
Occupation	Housewife	46	Housewife	47	>0.05
	Unemployed	1	Unemployed	2	
	Civil servant	10	Civil servant	12	
	Self-employed	8	Self-employed	33	
	Retired	39	Retired	6	
Economic status	<1000	59	<1000	61	>0.05
	1000–2000	33	1000–2000	28	
	>2000	10	>2000	11	

Statistical Analysis

SPSS for Windows 17.0 software was used for the statistical analysis. Descriptive statistical analysis methods were used for sociodemographic data. The chi-square test was used in categorical data, and the t-test was used for continuous data when the differences between the study group and the control group were compared. The Mann-Whitney U test was used to compare the 2 groups when parametric assumptions were not met. Pearson's correlation test was used to assess the correlation between inventory scores and cancer-associated parameters. P values <0.05 were considered statistically significant.

Results

The study and control groups consisted of 102 and 100 individuals, respectively. The mean age in the study group was 53.73±12.46 years, whereas the mean age in the control group was 51.02±12.80 years. There were 58 females (57%) and 44 males (43%) in the study group and 60 females (60%) and 40 males (40%) in the control group. There were 2 single, 86 married, and 14 widowed/divorced patients in the study group. There were 1 single, 82 married, and 17 widow/divorced individuals in the control group. There was no significant difference in these 3 parameters (age, gender, and marital status), as well as between occupation and socioeconomic level between the study group and the control group (p>0.05). The sociodemographic features of the study and control groups are presented in Table 1.

The study group consisted of 102 cancer patients: 39 (38.2%) had breast cancer, 19 (18.6%) had lung cancer, 10 (9.8%) had head and neck cancer, 9 (8.8%) had gynecologic cancer, 8 (7.8%) had stomach cancer, 7 (6.9%) had colorectal cancer,

and 10 (9.8%) had other malignancies. Twenty-four of the patients (23.6%) had Stage I-II, 64 (62.7%) had stage III, and 14 (13.7%) had stage IV disease.

Significant differences were determined in the measured scores between cancer patients and the control group. The mean Beck depression inventory (BDI) and Beck anxiety inventory (BAI) scores in the study group were 17.69±6.52 and 16.26±3.09, respectively. The mean BDI and BAI scores in the control group were 12.07±3.82 and 10.86±3.07, respectively. There was a significant difference in the Beck depression (t=7.94) and anxiety (t=8.77) inventories between the groups (p<0.05).

This study primarily investigated the suicide-associated data in cancer patients and controls. All patients and the control group were given information about suicide attempts. In the study group, 13 out of 102 patients (12.74%) attempted suicide (3 patients before cancer diagnosis and 10 patients after cancer diagnosis). In the control group, only 3 out of 100 patients (3%) attempted suicide. There was a significant difference between the groups according to the chi-square test (chi-square value=6.57) (p<0.05). The number of suicide attempts was only 1 for all cases, and all cases reported a suicide attempt by taking excessive medication. Furthermore, suicide ideation and behavior inventories were applied to both groups. The mean suicide behavior and ideation scores in the study group were 1.25±2.07 and 2.49±2.69, respectively. In the control group, the mean suicide behavior and ideation scores were 0.25±0.27 and 0.62±0.46, respectively. There was a significant difference in suicidal behavior (t test=5.92) and ideation (t test=8.94) inventories between the study group and the control group (p<0.05).

This study also used the MSPSS to investigate the perceived social support in cancer patients and the control group. The

Table 2. Inventory scores of the study and the control group.

	Study (n=102)	Control (n=100)	p
Beck depression	17.70±6.53	12.07±3.82	<0.05
Beck anxiety	16.26±5.38	10.86±3.09	<0.05
Suicidal ideation	2.49±2.69	0.60±0.37	<0.05
Suicidal behavior	1.24±2.08	0.2±0.2	<0.05
MSPSS total	23.51±8.11	30.82±5.75	<0.05
MSPSS family	15.58±6.24	18.75±4.27	<0.05
MSPSS friend	8.03±2.60	11.86±2.76	<0.05

mean total score in the control group and the study group were 30.82±5.75 and 23.50±8.11, respectively. There was a significant difference in MSPSS total score between the study group and the control group (t test=−7.40) (p<0.05). When evaluating the MSPSS sub-inventory scores in the study group, the mean family sub-inventory score was 15.57±6.24, the mean friend sub-inventory score was 8.02±2.60 and the mean significant other sub-inventory score was 0.25±1.11. In the control group, the mean family sub-inventory score was 18.75±4.27, the mean friend sub-inventory score was 11.86±2.75 and the mean significant other sub-inventory score was 0.14±0.71. There was a significant difference in family (t test=−4.22 and friend (t test=−10.14) sub-inventories between the study group and the control group (p<0.05). There was no significant difference in special sub-inventory scores between the groups (p>0.05). All compared inventory scores of the study and the control group are presented in Table 2.

The current study investigated the correlation between certain cancer-related parameters and inventory scores using Pearson's correlation test. We investigated the correlation between cancer stages, and suicidal ideation and behavior inventory scores. There was a significant correlation between suicidal ideation and disease stage (p<0.05; r=0.341) and between suicidal behavior and disease stage (p<0.05; r=0.231). When evaluating the correlation between Beck depression and anxiety inventories and disease stage, there was a significant correlation between the disease stage and BDS (p<0.05; r=0.263), but there was no correlation between the disease stage and BAI (p>0.05). Similarly, there was a significant negative correlation between the MSPSS score and the disease stage (p<0.05; r=−0.297). We were unable to determine a correlation between disease duration and any of the inventories (p>0.05).

When comparing the mean total MSPSS, family MSPSS, friend MSPSS, BDI, and BAI scores of the 13 patients in the study group who had a previous history of suicide attempts with the 89 patients who did not have a history of suicide attempts using the Mann-Whitney U-test, the mean total MSPSS, family MSPSS, friend MSPSS, BDI and BAI scores in 13 patients

with previous history of suicide were 18.61±8.7, 11.15±6.01, 7.00±2.38, 24.92±7.72, and 17.3±3.90, respectively. On the other hand, the mean total MSPSS, family MSPSS, friend MSPSS, BDI, and BAI scores in 89 patients with no previous history of suicide attempts were 24.22±7.81, 16.22±6.03, 8.17±2.61, 16.64±5.64, and 16.11±5.56, respectively. The differences in the total MSPSS (Mann-Whitney U=864.00), family MSPSS (Mann-Whitney U=843.50), and BDI scores (Mann-Whitney U=518.50) between the groups were significant (p<0.05), whereas the difference in friend MSPSS and BAI scores between the groups were not significant (p>0.05).

Discussion

Cancer is a disease that usually leads to mortality if not diagnosed and treated early, and has a high risk for psychiatric disorders with varying stages that could lead to suicide, depression, anxiety, and adjustment disorder [5].

Depression frequently accompanies different cancer types, and reduces the patients' quality of life, increases the duration of hospitalization, leads to more difficult adaptation to treatment, and constitutes a risk factor for suicide. The current study found a significantly higher mean BDS score in the study group (17.69±6.52) compared to the control group (12.07±3.82). Fifty-three patients (50%) scored above the BDS cut-off level of 17. The incidence of depression has been reported to be high in cancer patients [3]. Although, depression diagnosis was not made with the structured clinical interview, half of the patients were depressive by BDS. Major depression, adjustment disorder with depressive symptoms, and depression related to a general medical condition are the most frequent events in cancer patients. A review study reported major depression in 10–25% of cancer patients, and clinically significant depressive symptoms had a similar incidence [3,29]. Derogatis et al. carried out a study on 215 cancer patients, and reported major depression in 13% of the patients [30]. Massie et al., on the other hand, carried out a study on 546 patients who were asked for consultation, and determined adjustment disorder in

54% of the patients and major depression in 9.0% of the patients [31]. Similarly, Tokgoz et al. carried out a study using a Structured Clinical Interview for DSM-IV (SCID) in Turkey, and determined depression in 22% of cancer patients [32]. Kutlu et al. also determined 31.4% depression with a BDS cut-off value of 17 [33]. The varying rates in these studies may result from the wide range of patient group sizes, and tools used to detect cancer type, stage, and depression.

Anxiety attacks are frequently encountered in cancer patients during the first diagnosis and crisis periods. The study group had a significantly higher mean BAI score (16.26±3.09) compared to the control group (10.86±3.07). By setting a BAI cut-off value of 16, anxiety was detected in 44 patients (43.1%). The most frequent anxiety types in cancer patients were acute stress disorder, post-traumatic stress disorder (PTSD), common anxiety disorder, panic disorder, and anxiety related to general medical condition. According to studies using BAI on self-report measurements, PTSD is observed in 6–19% of cancer patients, and subthreshold PTSD was observed in 5–13% of cancer patients. According to the semi-structured interviews with cancer patients, the incidence of PTSD ranged between 1.9% and 50%, while the incidence of lifelong PTSD ranged between 3% and 35% [3,20]. Tokgoz et al. determined that the incidence of PTSD was 19% in cancer patients [20]. Considering that this study was unable to diagnose anxiety disorder subgroups using the anxiety measurement tool, this rate seemed to be in line with the results of these studies.

The primary objective of the current study was to investigate suicidal ideation and behavior in follow-up cancer patients, and to analyze the correlation between depression, anxiety, and perceived social support and disease-associated factors.

In the study group, 13 out of 102 patients (12.74%) attempted suicide, whereas 3 out of 100 individuals (3%) in the control group attempted suicide. There was a significant difference between these groups according to the chi-square test. According to Tokgoz et al., suicidal ideation was observed in 11% of the patients in Turkey, while they were unable to determine any patient who attempted suicide [20]. Akechi et al. carried out a study on 140 terminal cancer patients in Japan, and reported self-reported suicidal ideation in 8.6% of the patients, and self-reported suicidal interest in 5% of the patients. Considering that the incidence of suicidal ideation and interest is 13.6% in total, these findings should be evaluated by considering the role of suicide in Japanese society [15]. Mandeira et al. carried out a study on 130 patients using the depression anxiety scale, Beck despair inventory, and Beck suicidal ideation inventory, and reported that 34.6% of the patients had death ideation, but only 10% of the patients had active suicidal ideation [34]. In a review by Robson et al., the authors stated that the incidence of suicidal ideation in cancer patients

ranged from 0.8% to 71.4% [35]. The current study used suicidal ideation and behavior inventories in both groups. The mean suicidal behavior and ideation score in the study group (1.25±2.07, 2.49±2.69) was significantly higher compared to the control group (0.25±0.27, 0.62±0.46). This finding suggests that the rate of previous suicidal attempts was higher in the study group, as well as the rate of current suicidal ideation and behavior risk.

The MSPSS total, family, and friend sub-inventory scores, which were used to determine the association between social support, and suicidal ideation, behavior, depression, and anxiety levels, were lower in the study group (23.50±8.11, 15.57±6.24, and 8.02±2.60, respectively) compared to the control group (30.82±5.75, 18.75±4.27, and 11.86±2.75, respectively). There was no significant difference in the other sub-inventories. These findings indicate that perceived social support from family and friends is lower in the study group compared to the control group. This finding suggests that disease affects patients' relationships with their families and social circles, and that the patients had higher expectations of their families and social circles. The absence of a significant difference in the other sub-inventories may indicate that there is no difference in this area between the groups. It could be also that the particular sub-inventory was not understood by the patients and the control group.

In the study group, when the mean total MSPSS, family MSPSS, friend MSPSS, BDI, and BAI scores of 13 patients who had a history of suicide attempt were compared to the 89 patients who did not have a history of suicide attempts, using the Mann-Whitney U test, the mean total MSPSS, family MSPSS, friend MSPSS, BDI, and BAI scores in the 13 patients who had a history of suicide attempts were 18.61±8.7, 11.15±6.01, 7.00±2.38, 24.92±7.72, and 17.3±3.90, respectively. The mean total MSPSS, family MSPSS, friend MSPSS, BDI, and BAI scores in the 89 patients who did not have a history of suicide attempts were 24.22±7.81, 16.22±6.03, 8.17±2.61, 16.64±5.64, and 16.11±5.56, respectively. The difference in total MSPSS, family MSPSS, and BDI scores between the groups was significant, whereas the difference in friend MSPSS and BAI scores between the groups were not significant. This finding indicates that a low level of social support from the family and depression particularly increased the risk of suicide attempts, which is consistent with the literature. Botega et al. determined a correlation between suicidal ideation and depression, and found that the incidence of suicidal ideation was 8.3-fold greater in depressive patients [36]. In their review, Anguiano et al. stated that in the first year after diagnosis, depression and despair were high-risk factors for suicide [37]. Kim et al. carried out a study on 138 patients, and determined suicide attempt in 16.4% of the patients, and suicidal ideation in 47.3% of the patients. The authors also determined a negative correlation between social support, and suicidal ideation and behavior [38].

When the correlation between cancer stage and suicidal ideation and behavior inventory scores were evaluated, there was a significant correlation between disease stage and suicidal ideation (p<0.05; r=0.341), and also between disease stage and suicidal behavior (p<0.05; r=0.231). The incidence of suicidal ideation and behavior increased with increasing disease stage. These findings are indicated in the literature as increasing suicide risk with increasing severity of clinical stage, and experiencing shock in new metastases. The increasing suicide risk as patients approach the terminal stage is consistent with progressive deterioration in quality of life, physical dependency, and inability to provide pain management [39,40].

When the correlation between Beck depression and anxiety inventories and disease stage was evaluated, there was a significant correlation between the disease stage and BDI (p<0.05; r=0.263), while there was no correlation between the disease stage and BAI (p>0.05). Anxiety attacks are frequently seen in cancer patients at initial diagnosis and during crisis periods. Increasing depression, but not anxiety, in the advanced stages could be interpreted as the replacement of initial hope, uncertainty, anxiety, and fear of death with despair and preparing oneself for the expected end. Moreover, organic mental disorders and cognitive disorders should be considered in advanced stages. Some studies have reported an increased incidence of anxiety and depression with increasing follow-up periods, but there is no direct correlation between these parameters and disease stage.

A significant correlation was also determined between the MSPSS score and the disease stage (p<0.05; r=–0.297). The decrease in perceived social support with increasing disease stage could be related to the decrease in or breakdown of relationships with the social circle, physical pain and discomfort, increase in expectations due to the high-level of deterioration in quality of life, and/or reduction in the level of support provided by the social circle due to exhaustion and despair. No correlation was determined between disease duration and depression, anxiety, suicidal behavior, and ideation, and the MSPSS score. Some studies have reported frequent anxiety, acute stress disorder, PTSD, and adjustment disorder in the first stages of the disease, whereas other studies have reported higher incidence of suicide during the first year after diagnosis [3,5,12,13,41].

The major limitations of the current study are the small number of patients, the study group consisting of patients who had different cancer types, and self-report measures. The study has certain advantages over previous studies, which include an inquiry into the previous history of suicide, which could be related to suicide, using valid and reliable inventories such as suicidal ideation and behavior inventories, and using a control group for comparison.

Conclusions

In recent years, psycho-oncology has achieved a crucial place in research on consultation liaison psychiatry. These studies have provided a basis for placing emphasis on factors that could be associated with a high incidence of psychiatric comorbidities and suicide rates, developing rehabilitation programs for these factors, and making interdisciplinary collaborations.

Depression, anxiety, social support, and suicidality are important interactive factors in cancer patients. Increase in social support might help to decrease depression, anxiety, and suicide. Moreover, there is a need to establish cancer monitoring centers in Turkey that can also provide patients with social support in addition to medical care, maintain patient records regularly, and follow up on the patients.

We believe that more comprehensive studies in the future will help to elucidate this area, and contribute to the development of diagnostic and treatment guidelines against cancer-related suicide.

Acknowledgements

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