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ORIGINAL ARTICLE

Depression and anxiety in cancer patients and their relatives

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Summary

Purpose: *To investigate the depression and anxiety levels and the factors that affect patients receiving chemotherapy and their relatives with the Beck Depression Inventory (BDI) and State-Trait Anxiety Inventory (STAI) scoring system.*

Methods: *330 patients and 330 relatives of these patients were enrolled in this study. The study forms including the questions regarding the patient demographic characteristics, BDI, and STAI were completed during face-to-face interviews by trained interviewers for the determination of the psychological status of the patients and their relatives. BDI and STAI were validated for Turkish population by studies made before.*

Results: *According to BDI scale, 96 (29.1%) patients had mild and 60 (18.2%) had severe depression. Seventy-one (21.5%) relatives had mild and 24 (7.3%) had severe depression. Anxiety evaluation was made by STAI scale and a statistical difference emerged between patients and relatives (patients: 44.93±8.8 vs relatives: 43.27±8.5, p=0.015). The depression and anxiety levels were higher in women, in people with low socio-economic level, in people having a time period between diagnosis and participation in the study longer than 6 months, and in people having relapsing disease.*

Conclusion: *Since there are many emotional and psychological disorders in patients and their relatives, much attention should be paid in order to diagnose and treat their psychiatric disorders and enough information about their disease should be given.*

Key words: *anxiety, cancer, cancer patients, depression, relatives*

Introduction

Cancer is perceived as a serious and chronic disease which contains hopelessness and uncertainties, reminds of a painful death, evokes guilt and anxiety, and creates panic and confusion. In this sense, cancer causes a disaster and a dramatic breakdown in the psychic balance of the person [1].

The first reactions of an ill person are shock and unbelief. In this period, non acceptance of the truth is a defense against the feelings of anxiety and hopelessness arising out of this truth which is very difficult to endure. In the second phase the patient reactions become larger. The basic reaction in this period is anxiety. Feelings of threat of non-existence, loss of perception, separation and death thoughts, and alienation with the body are the basic elements of this anxiety. The third phase is the period in which the patient accepts the truth, directs his/her energy and moral power to the new life, and is the period of relief and concert provided by the feeling that he/she can do things again which are blocked due to the start of treatment. It's the period that the patient learns to live with the disease [1,2]. If the emotional and behavioral reactions exceed the limits which are expected or deemed normal it can turn into a clinical depression [3].

In the prevalence study [4] on the determination of psychiatric disorders arising in cancer, 53% of the patients showed "normal reaction behavior to disease" which is not included in any category

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of the DSM (Diagnostic and Statistical Manual of Mental Disorders) III criteria and psychiatric disorders were determined in 47% of the patients. In this study, it has been determined that 10% of the patients with psychiatric disorders had already history of psychiatric disorders and the incidence and prevalence of psychiatric disorders in cancer patients are higher than in patients with other physical diseases and the normal population [4]. In this study, and the other prevalence studies, the incidence of mental disorders in cancer patients ranges between 29 to 47% [5].

Cancer diagnosis is not only an individual experience. It also causes a certain tension and anxiety in the other family members and relatives. Patient relatives who are witnesses of the mental and physical changes, pain and hopelessness of their loved one, become tired and unhappy. They also have to take on the patient's function in the family. The other problem is that the patient can't work because of the disease so the family income decreases. In particular, the individual who takes care of the patient might develop physical difficulties and physical diseases because of this. Several authors have stated that the members of the family experience more anxiety, depression, tiredness, role conflicts, social isolation and troubles than the patients themselves. As a result, their immune system may deteriorate, so they may be exposed to physical diseases [6]. The study of Baral et al. shows that in the first month after diagnosis medium or severe depression is 62%, while this rate reaches 90% in the 6 months following diagnosis [7].

If we determine the psychological disorders developing in the cancer patient and his/her relatives who jointly experience and endure the pain, anxiety and hopelessness of the patient, we can develop ways of resolution to facilitate the adaptation of both the patient and his/her relatives to this new condition.

With this aim, we have evaluated the depression and anxiety levels and their impacting factors in Turkish patients receiving chemotherapy based on cancer diagnosis and their relatives using the BDI and STAI scales.

Methods

Three hundred and thirty cancer patients who applied to the hospital and 330 relatives of these patients were enrolled in this study.

Data were collected by using a series of forms during face-to-face interviews by trained interviewers for determining the psychological status of the patients and their relatives. The first form consisted of questions regarding the demographic characteristics of the patient and relatives. The second form was the Turkish version of the BDI.

BDI is a series of questions developed to measure the intensity, severity, and depth of depression in patients with psychiatric disorders. BDI was developed in 1961 by Beck. BDI is composed of 21 questions or items, each with 4 possible responses. Each response is assigned a score ranging from zero to three, indicating the severity of the symptom. Individual questions of the BDI assess mood, pessimism, sense of failure, self-dissatisfaction, guilt, punishment, self-dislike, self-accusation, suicidal ideas, crying, irritability, social withdrawal, body image, work difficulties, insomnia, fatigue, appetite, weight loss, bodily preoccupation, and loss of libido. Items 1 to 13 assess symptoms that are psychological in nature, while items 14 to 21 assess more physical symptoms [8]. BDI was translated into Turkish and its reliability was recalculated by Tegin and Hisli [9,10]. For the Turkish population, a score of 17 or over represents depression by Hisli. We used these cut-off scores to determine the levels of depression.

The third form was the Turkish version of STAI. STAI provides a reliable measure of anxiety. First developed by Spielberger in the 1970s STAI consists of two subscales: state anxiety and trait anxiety. The first subscales (20 items) measure state anxiety by asking subjects how they feel "right now." The second subscales (20 items) measure trait anxiety by asking subjects how they "generally" feel. Each response is assigned a score ranging from one to four, indicating the severity of the symptom. State and trait anxiety are scored separately. Both scores range from 20 to 80, high scores indicate a greater level of anxiety [11]. It was translated and validated in Turkish language by Oner [12]. We used trait anxiety subscales in this study.

Statistics

All data were analyzed by using SPSS for Windows, version10.0. Descriptive statistics summarized the continuous variables as frequencies and percentages for categorical, mean and standard deviation. Independent samples t-tests or one-way Analysis of Variance (ANOVA) were used to compare categorical variables, Beck Depression and Trait Anxiety score between two groups. Bonferoni's correction for multiple testing was performed by multiplying the p value with the number of tests where appropriate. A value of $p<0.05$ was considered as significant.

Results

The sociodemographic characteristics of the patients and their relatives study are shown in Table 1. When both groups were evaluated in terms of demographic characteristics, no difference was

Table 1. Sociodemographic characteristics of patients and patient relatives

Characteristics	*Patients (N=330) N (%)*	*Relatives (N=330) N (%)*	*p-value**
Age, years, mean±SD (range)	53.04±138 (20-83)	45.29±13.2 (17-72)	NS
Gender			
Male	153 (46.4)	142 (43)	NS
Female	177 (53.6)	188 (57)	
Marital status			
Married	280 (84.8)	263 (79.7)	NS
Single (widowed, divorced, not married)	50 (15.2)	67 (20.3)	
Education			
Literate	13 (3.9)	10 (3)	
Primary education	143 (43.3)	110 (33.3)	0.03
High school	98 (29.7)	104 (31.5)	
University	76 (23)	106 (32.1)	
Monthly income (TL)			
0–250	71 (21.5)	92 (27.9)	
250–500	67 (20.3)	57 (17.3)	NS
500–1000	153 (46.4)	132 (40)	
1000–2000	25 (7.6)	37 (11.2)	
2000 and above	14 (4.2)	12 (3.6)	
Smoker	90 (27.3)	126 (38.2)	0.003
Profession			
Housewife	128 (38.8)		
Employed	120 (36.4)		
Retired	82 (24.8)		

* t test, NS: not significant, TL: Turkish lira (=0.8 $)

observed in characteristics such as age, gender distribution, monthly income, marital status and alcohol use. It has been observed that the educational status of patient relatives was significantly higher compared to the patients themselves. When jobs of the patient group were evaluated, the majority of the patients were housewives (N : 128; 38.8%).

The characteristics of the patients regarding the disease and treatment are summarized in Table 2.

It has been determined that 28 (8.5%) of the patients did not know the diagnosis. When the question "If you did not know the diagnosis, would you like to be told?" was asked to 302 patients who knew the diagnosis, 14 patients (4.5%) said that they did not want to know.

Seventy-eight (23.6%) of the 330 patient relatives stated that they did not want that the patients should know the diagnosis due to various reasons ("I don't want him/her to be demoralized", "he/she should not be upset," "he/she should not get into hopelessness").

Of 302 patients knowing the diagnosis, 243 (80%) stated that they had information about the disease but 59 (20%) stated that they did not have such an information. The majority of the patients and relatives stated that they got the information from the doctors (82 vs 78.6%). A small number in both groups used ways of obtaining information outside the doctor (neighborhood and relatives, press and TV, internet).

Regarding the degree of kinship of the pa-

Table 2. Disease characteristics and its treatment

Characteristics	*Patients N=330 N (%)*
Diagnosis	
Colorectal cancer	86 (26.1)
Breast cancer	74 (22.4)
Non colorectal GI cancer (stomach, pancreas, etc)	44 (13.3)
Lung cancer	43 (13)
Genitourinary cancer	33 (10)
Other (sarcoma, testis, lymphoma, melanoma)	50 (15.2)
Stage	
Local disease	38 (11.5)
Locally advanced disease	131 (39.7)
Advanced-stage disease	161 (48.8)
Relapse	
Yes	74 (22.4)
No	256 (77.6)
Treatment	
Chemotherapy	217 (65.8)
Chemotherapy and radiotherapy	113 (34.2)
Treatment place	
Ambulant patient	215 (65.2)
Hospitalized patient	115 (34.8)

tients' relatives, a majority of the relatives sharing the disease consisted of patient spouses (190, 57.6%). By decreasing incidence children, mother, father, siblings, and other relatives were sharing the disease with the patient.

The patient and relatives were compared with each other in terms of BDI and STAI scores (Table 3). Comparison of both groups showed that the BDI scores of the patients were significantly higher than the scores of the patient relatives (14.7±9.8 vs 10.3±7.6, p<0.0001). Besides the STAI anxiety scores of the patients were significantly higher than the scores of the patient relatives (44.93±8.8 vs 43.27±8.5, p=0.015).

There was no significant difference in terms of BDI and STAI scores between male and female patients. However, in relatives the BDI (11.5±8.2 vs 8.6±6.5, p=0.001) and STAI scores (44.7±8.5 vs 41.3±8.1, p<0.0001) were significantly higher in females. No significant difference in scores was seen between married or singles.

Significant negative correlation between the educational status of patients and relatives with STAI anxiety scores was found (p=0.0001 vs p=0.02) (Table 4). BDI scores showed that the patients who had high educational level had lower depression scores. However, this difference was statistically insignificant (p=0.09 vs p=0.07).

The income of the patients affected significantly only STAI anxiety score. This score was higher in persons with low income and lower in persons with high income (p=0.009). Concerning the BDI score, no significant relationship in terms of income was found (Table 5).

Also, no significant difference was found in the BDI scores and STAI scores between patients knowing their diagnosis and those who did not (14.6±9.7 vs 16.0±10.6, p=0.47 and 45.6±8.0 vs 44.8±8.9, p=0.65, respsectively). The BDI (17.6±11.1 vs 13.8±9.2, p=0.007), and STAI (47.9±9.8 vs 44.0±8.5, p=0.002) scores of the patients having no information regarding the disease were significantly higher compared to those without information.

The stage of disease was significantly correlated with the BDI scores for patients and also for their relatives (p<0.0001 vs p=0.001). Although a parallel increase was detected in the STAI anxiety scores and stage of disease in both groups, this increase was significant only in the patient relatives (p=0.32 vs p=0.02). Disease relapse significantly increased the BDI scores (14.1±9.6 vs 16.9±10.3, p=0.03) in patients but it did not cause a significant change in the STAI scores (Table 6).

The patients were also examined regarding the period between diagnosis and the date of the survey. In the group which had a period more than 6 months between date of diagnosis and study date, the BDI scores were significantly higher than in patients with a period less than 6 months

Table 3. Comparison of BDI and STAI scores of patients and patient relatives

	N	*Average*	*SD*	*Minimum*	*Maximum*	*p-value**
BDI						
Patient	330	14.76	9.846	0	57	<0.0001
Patient relative	330	10.33	7.689	0	40	
STAI						
Patient	330	44.93	8.896	20	80	0.015
Patient relative	330	43.27	8.532	23	65	

*t test, BDI: Beck Depression Inventory, STAI: State-Trait-Anxiety Inventory, SD: standard deviation

Table 4. Comparison of BDI and STAI scores of patients and patient relatives in terms of educational level

	Patients			*Patient relatives*		
	N (%)	*Mean ± SD*	*p-value**	*N (%)*	*Mean ± SD*	*p-value**
BDI scores						
Literate	13 (4)	18.6±9.3		10 (3)	11.5±8.2	
Primary Ed.	105 (32)	16.3±9.6		77 (24)	12.0±8.4	0.07
Secondary Ed.	38 (11)	15.1±10.4	0.09	33 (10)	10.2±7.7	
High School	98 (30)	13.7±10.4		104 (31)	10.5±7.6	
University	76 (23)	13.0±8.7		106 (32)	8.7±5.8	
STAI scores						
Literate	13 (4)	54.1±6.4		10 (3)	44.5±10.2	
Primary School	105 (32)	46.8±8.6		77 (24)	45.3±8.3	
Secondary School	38 (11)	44.3±8.1	0.0001	33 (10)	44.2±8.5	0.02
High School	98 (30)	43.1±8.7		104 (31)	43.5±8.5	
University	76 (23)	43.2±8.7		106 (32)	41.1±8.1	

*ANOVA, SD: standard deviation

Table 5. Comparison of BDI and STAI scores of patients in relation to income of patient relatives

	Patients			*Patient relatives*		
	N (%)	*Mean ± SD*	*p-value**	*N (%)*	*Mean ± SD*	*p-value**
BDI scores						
Income (TL)						
0–250	71 (21)	16.6±9.9	0.13	92 (28)	11.6±7.8	0.26
250–500	67 (20)	15.7±11.7		57 (17)	10.2±8.4	
500–1000	153 (47)	13.6±8.9		132 (40)	10.0±7.5	
1000–2000	25 (8)	15.4±9.9		37 (11)	9.0±6.9	
2000 and above	14 (5)	11.1±7.4		12 (4)	7.9±6.2	
STAI scores						
Income (TL)						
0–250	71 (21)	47.4±10.6	0.009	92 (28)	44.9±9.5	0.11
250–500	67 (20)	46.0±9.3		57 (17)	43.6±7.4	
500–1000	153 (47)	44.0±7.5		132 (40)	42.6±7.4	
1000–2000	25 (8)	42.6±9.3		37 (11)	41.8±8.1	
2000 and above	14 (5)	40.4±6.2		12 (4)	39.9±8.6	

*ANOVA, 1 Turkish lira (TL)=0,8 $, SD: standard deviation

Table 6. Comparison of Beck depression and STAI anxiety scores in patients and patient relatives according to disease stage

	Patients			*Patient relatives*		
	N (%)	*Mean ±SD*	*p-value**	*N (%)*	*Mean ± SD*	*p-value***
Beck depression*						
Local disease	38 (11)	10.1±6.7	<0.0001	38 (11)	7.1±5.7	0.001
Locally adv. disease	131 (40)	12.9±8.3		131 (40)	9.4±7.8	
Adv. stage disease	161 (49)	17.3±10.8		161 (49)	11.7±7.6	
STAI anxiety*						
Local disease	38 (11)	43.6±9.7	0.32	38 (11)	41.6±9.1	0.024
Locally adv. disease	131 (40)	44.4±8.5		131 (40)	42.1±8.1	
Adv. stage disease	161 (49)	45.6±8.9		161 (49)	44.5±8.4	
Beck depression**						
No relapse	256 (77)	14.1±9.6	0.03	256 (77)	10.1±7.7	0.52
Relapse	74 (23)	16.9±10.3		74 (23)	10.8±7.5	
STAI anxiety**						
No relapse	256 (77)	44.7±8.6	0.43	256 (77)	42.7±8.3	0.06
Relapse	74 (23)	45.6±9.7		74 (23)	44.9±8.9	

*ANOVA, **t-test

(16.9±10.0 vs 13.3±9.4, p=0.001).

In the evaluation of the BDI scores of the patients and their relatives, when 14 points and above were taken as basis (which is the limit value determined by Beck) 47.9% of the patients and 28.8% of the patient relatives were characterized as depressive. When the depression limit point of 17 and above (which was determined by Hisli et al. for the Turkish population in the Beck depression scale) was taken as basis, 35.2% of the patients and 17.6% of the patient relatives were depressive (Table 7).

Discussion

In 1984 Beck defined 14 points and above as a limit value for the depression diagnosis [8]. According to this value it was determined that 47.9% of our patients and 28.8% of their relatives were depressive. Hisli [10] defined the depression limit point in the Beck depression scale as 17 and above for the Turkish population. According to Hisli limit point, 35.2% of the patients and 17.6% of the patient relatives were depressive. Segrin et al. found depression rates as 32% and 33% of breast cancer patients and their relatives, respectively [13]. In the study of Gozum et al., 53.2% of Turkish cancer patients and 11.8% of their relatives were reported to be depressive [14]. It may be considered that the reason for different rates in different populations is that the general features and patient com-

Table 7. Rates of depressive patients and patient relatives

	Patients		*Patient relatives*	
	N	*%*	*N*	*%*
Beck depression score ≥ 14	158	47.9	95	28.8
Beck depression score ≥ 17	116	35.2	58	17.6

positions of these populations are different.

The Beck depression scale performed in order to determine the severity of the depressive symptoms of the patients was significantly higher compared to the patient relatives. In the study by Gozum et al., the severity of depressive symptoms in Turkish cancer patients was higher compared to the patient relatives [14]. In the study by Beser et al. anxiety and depression levels of the patients were raised during chemotherapy [15]. Grunfeld et al. reported similar depressive findings in patients and their relatives [16]. In our study, the detection of highly depressive symptoms may be explained by the presence of risk factors such as fear and uncertainty caused by word "cancer", uncontrollable side effects of treatment, hopelessness and anxiety for the future. Recently the incidence of anxiety in cancer patients is above 50% and approximately 30% of cancer patients suffer from chronic anxiety [17]. Impacting the patient's anxiety level, cancer diagnosis and therapies may cause deterioration in quality of life and make adaptation to treatment difficult [18,19]. It is particularly known that there is an intensive anxiety feeling after diagnosis which decreases in the following period [20].

In the study of Ferrario et al., the continuous anxiety levels in patients were higher than in the healthy population [21]. However, no significant difference has been observed between patient relatives and healthy population. The high depression feeling in patients who are trying to accept the diagnosis of cancer and to adapt to this condition and who are exposed to the impact of environmental factors (i.e. chemotherapy, social condition, and family) is an expected situation. However, in our study the determination of the level of anxiety in patients and relatives was important to discriminate the impact of the cancer concept in patient relatives and the patient himself.

The depression and anxiety levels in female patient relatives were higher than in those of male patients. It is known that, in the general society, depression and anxiety are more frequent in women [22]. At the same time, higher depression levels have been reported in women who take care of the patients than in men [23-25]. It is also reported that depression and anxiety are frequent in women with cancer [26]. However, due to the difference in the studies on this subject, clear comments cannot be made. In the study of Pandey et al. [27] it was stated that depression is more frequently observed in male patients, and in the study of Kaplan et al. [28] it has been reported that depression and anxiety were more frequent irrespective of gender. In our study, relatives of female patients had high levels of depression and anxiety scores, a result that is in concordance with the literature.

This study showed that patients and their relatives with high educational levels have low depression and anxiety levels. In other studies it is reported that low educational levels are accompanied by high levels of anxiety and depression [29,30]. Besides, it has been reported that low educational level is a risk factor for major depression [31-33]. It has also been emphasized that low educational level in cancer patients and their relatives is a risk for emotional problems such as anxiety and depression [21,34]. Our results are important in terms of emphasizing the impact of educational level on anxiety and depression in the Turkish patient population.

It has been found that the economic status significantly impacts the anxiety levels of the patients in our study. Nordin et al. [35] have reported that in cancer patients the emotional and economic support deficiency are special risk factors for anxiety and depression. In our study high levels of anxiety and depression were found in patients and their relatives with low income. The economic power plays also an important role in the struggle against the disease.

In our study no difference was found in the levels of depression and anxiety between patients knowing or not the diagnosis. In a study performed by Alexander et al. it has been shown that psychiatric disorders are lower in patients who don't know the true diagnosis and that these patients are more hopeful for the treatment results [36]. Atesci et al. showed that psychiatric disorders were less observed in patients who knew the cancer diagnosis compared to patients who didn't [5]. Contrary to these studies, in the study of Ersoy the BDI scores in patients knowing their cancer diagnosis were significantly low [37]. In our study the low number of patients not knowing their diagnosis may have affected the significance of the results.

Montgomery et al. have stated that, with clear information, the patients will be less exposed to psychological problems and they will better adapt to disease and treatment [38].

In our study it has been determined that in patients and patient relatives there was a positive correlation between disease stage and depression and anxiety levels. Advanced-stage disease, pres-

ence of symptoms attributed to the disease, adverse effects of treatment and decrease of expectations and hopes increase the depression levels. The high level of the rate of psychiatric disorders in a study performed especially on advanced-stage cancer patients is such an indicator [5]. Besides, in the present study it has been shown that the depression levels increase if the disease relapses.

Some follow-up studies reported that the patient anxiety and depression levels are correlated with the duration of disease [5,35,39] This may be related with the symptoms of a long-lasting disease.

We conclude that 47.9% of the patients and 28.8% of their relatives showed depressive symptoms. Depression and anxiety levels were higher in females, those with low income and low educational level, those with a diagnosis period longer than 6 months, suffering from advanced-stage disease and/or having disease relapse. It has also been determined that having enough information about the disease reduces the depression levels.

Cancer treatment requires a multi-disciplinary approach. Various studies have shown that in each stage of the treatment, there are many emotional impacts on patients and their relatives. As a result, psychological disorders develop. Therefore, it is very important that in each stage of treatment, psychosocial support should be given to patients and their relatives.

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