

# Correlation of Anxiety and Depression Levels with Attitudes Towards Coping with Illness and Sociodemographic Characteristics in Patients with a Diagnosis of Breast Cancer

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## ABSTRACT

Correlation of anxiety and depression levels with attitudes towards coping with illness and sociodemographic characteristics in patients with a diagnosis of breast cancer

**Objective:** The aim of this study was to investigate the relationship of anxiety and depression levels of breast cancer patients that had completed a year since receiving the diagnosis with their sociodemographic characteristics and attitudes towards coping with their disease.

**Method:** This study was conducted with 94 female patients between the ages of 35 and 65 years who had been diagnosed with breast cancer and who were treated at the Oncology Department of Cukurova University's Faculty of Medicine between June 5 and July 31, 2017. Data were collected via a personal information form prepared by the investigator, Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), and COPE inventory.

**Results:** It was found that 27.7% and 16.0% of patients with breast cancer who had completed one year of treatment and had not presented or been referred to psychiatry experienced clinically relevant anxiety symptoms and depressive symptoms, respectively. A positive relationship was found between depression and anxiety in breast cancer patients ( $p<0.05$ ,  $r=0.68$ ). The level of anxiety was higher in patients who were not sufficiently informed about the disease ( $p=0.014$ ) and who thought that the partner was behaving more distant ( $p=0.019$ ). Patients between the ages of 35 and 44 years were found to be more depressive and anxious than those at age 55-65 ( $p=0.006$  and  $p=0.010$ , respectively). It was found that primary school graduates were more likely to use "religious coping" ( $p=0.02$ ) and university graduates were more likely to use "humor" ( $p=0.04$ ). In addition, "positive reinterpretation" and "planning" attitudes were found to be more common in those with sufficient knowledge of the disease ( $p=0.045$  and  $p=0.01$ , respectively). There was a negative correlation between depression and "mental disengagement" ( $p=0.011$ ) and "active coping" ( $p=0.008$ ). There was a positive relationship between anxiety and "use of emotional social support" ( $p=0.038$ ).

**Conclusion:** In our study, sufficient information about the disease and the partner's behavior were found to be associated with anxiety in breast cancer patients, and coping attitudes were found to be effective regarding depression and development of anxiety. Addressing the psychological effects of breast cancer and giving importance to psychosocial interventions and coping attitudes have been considered preventive factors in the development of depression and anxiety.

**Keywords:** Anxiety, breast cancer, coping attitudes, depression

## ÖZ

Meme kanseri tanısı olan hastalarda anksiyete ve depresyon düzeylerinin hastalıkla başa çıkma tutumları ve sosyodemografik özellikleri ile ilişkisi

**Amaç:** Bu araştırmanın amacı tanı aldıktan sonra birinci yılını tamamlamış meme kanseri hastalarının anksiyete ve depresyon düzeylerinin, hastalıkla başa çıkma tutumları ve sosyodemografik özellikleri ile ilişkisini incelemesidir.

**Yöntem:** Bu çalışma, 5 Haziran-31 Temmuz 2017 tarihlerinde Çukurova Üniversitesi Tıp Fakültesi Balcalı Hastanesi Onkoloji Polikliniğinde tedavi gören, 35-65 yaş aralığındaki 94 meme kanseri kadın hastayla yapılmıştır. Araştırmada veri toplama amacı ile araştırmacı tarafından hazırlanan kişisel bilgi formu, Beck Depresyon Envanteri (BDE), Beck Anksiyete Envanteri (BAE), COPE (Başa Çıkma Tutumlarını Değerlendirme Ölçeği) kullanılmıştır.

**Bulgular:** Tedavide bir yılını tamamlamış ve psikiyatrik başvurusu olmamış veya yönlendirilmemiş meme kanseri hastalarının %27.7'sinde klinik olarak değerlendirmeyi gerektirecek düzeyde anksiyete, %16.0'ında depresyon belirtileri saptanmıştır. Meme kanseri hastalarında depresyon ve anksiyete arasında pozitif bir ilişki belirlenmiştir ( $p<0.05$ ,  $r=0.68$ ). Hastalığı konusunda yeterince bilgilendirilmeyen ve eşinin daha mesafeli davrandığını düşünenlerde anksiyete düzeyi yüksek bulunmuştur ( $p=0.014$ ,  $p=0.019$ ). Otuzbeş - kırkdört yaş aralığında, 55-65 yaş aralığına göre yüksek depresyon ve anksiyete düzeyi belirlenmiştir ( $p=0.006$ ,  $p=0.010$ ). Eğitimi ilköğretim düzeyinde olanların "dini olarak başa çıkmayı" ( $p=0.02$ ), üniversite düzeyinde olanların "mizah" daha çok kullandığı ( $p=0.04$ ), hastalığı ile ilgili yeterince bilgi sahibi olanlarda "pozitif yeniden yorumlama" ve "plan yapma" başa çıkma tutumlarının daha çok kullandığı saptanmıştır ( $p=0.045$ ,  $p=0.01$ ). Depresyon ile başa çıkma tutumlarından zihinsel boş verme ( $p=0.011$ ) ve aktif başa çıkma ( $p=0.008$ ) arasında negatif yönlü bir ilişki olduğu, anksiyete ile duygusal sosyal destek kullanımı ( $p=0.038$ ) arasında pozitif bir ilişki olduğu belirlenmiştir.

**Sonuç:** Bu çalışmada meme kanseri hastalarında hastalıkla ilgili yeterli bilgilendirmenin, eş davranışının anksiyete ile ilişkili olabileceği, başa çıkma tutumlarının depresyon ve anksiyete gelişimi üzerinde etkili olduğu sonucuna varılmıştır. Meme kanserinin psikolojik etkilerinin göz önünde bulundurulmasının ve tedavide psikososyal müdahalelere ve başa çıkma tutumları ile ilgili terapötik yaklaşımlara önem verilmesinin depresyon ve anksiyete gelişiminde önleyici bir faktör olacağı sonucuna ulaşılmıştır.

**Anahtar kelimeler:** Anksiyete, meme kanseri, baş etme tutumları, depresyon



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## INTRODUCTION

It has been reported that besides being a common cause of death, cancer increases the risk of developing psychiatric disorders (1). Cancer, which disrupts the life course and puts the afflicted person's existence in serious danger, undoubtedly affects them profoundly. While trying to cope with this crisis, patients also have to make decisions of vital importance and are forced to re-arrange their lives according to the effects of both the disease and the treatment (2).

Breast cancer is the most commonly seen type of cancer in women, where the increase in prevalence and survival rate is accompanied by a better understanding of the importance of evaluating psychological reactions and providing psychological support to patients. Knowing the mental conditions that may have an impact on the physical severity and course of the disease and treatment response affects the quality of life, care, and compliance with the treatment. It should be kept in mind that the patient needs psychosocial support in addition to medical treatment (3).

Treatment options for cancer may have significant side effects, affecting the physical well-being of the person and reducing the quality of life (4). These side effects include nausea and vomiting, hormonal changes, energy loss, pain, and fatigue, which negatively influence patients' daily lives (5). Apart from these factors, in breast cancer mastectomy specifically leads to psychosocial problems secondary to the disruption of bodily integrity.

It has been reported that the information that cancer patients mainly need includes available treatment options, side effects of therapies, prevalence of the disease, likelihood of cure, and prognosis (6).

Since the concept of disease involves both objective and subjective dimensions, people with a similar disease may have different opinions about their situation and may show different reactions. While some people display a sense of humor and courage in their illness, others have difficulties, experiencing intense feelings of anger, fear, or hopelessness. The most common emotional reactions of patients include anxiety, fear, anger, power-weakness, sadness and

sorrow, incompetence, failure, shame, guilt, hope-despair, and relaxation (7).

In breast cancer, anxiety, depression, uncertainty about the future, desperation, hopelessness, fear of recurrence, diminished self-esteem, loss of femininity, and fear of death lead to psychological problems. In addition to the general problems of cancer, it is important to pay attention to reactions to the loss of a tissue with symbolic importance for the female body (8).

For the co-occurrence of breast cancer and depression, a broad range of 1.5 to 50.0% has been reported, which was attributed both to a wide variety of measures to assess and diagnose major depressive disorder and to the fact that patients in these studies were assessed in different stages of the disease and treatment (9). A meta-analysis involving the years from 1990 to 2005 examined and revealed the association between depression and cancer (10). Depression is a disease that can be seen at all ages, but studies have shown its incidence to peak around the age of 44 years (11).

Considering the evidence for its potential role as a critical psychosocial factor in overall cancer-related mortality, anxiety rates in this population are also important (12). Anxiety has been investigated in view of its potential of constituting a risk factor for cancer treatment. It might not only be a condition that accompanies depression in cancer patients but also a reason for cancer development.

Knotkova et al. (13) and Teunissen et al. (14) detected a positive correlation between anxiety levels and depression levels in their study regarding breast cancer patients.

Berard (3), Amicheti et al. (15), and Rakovič et al. (16) reported that the stage of breast cancer affected the patients' life span and quality of life, and that a prolonged duration of care and hospitalization in advanced stages were associated with increased levels of anxiety and depression.

Cancer not only affects patients but also their loved ones, family, and friends. Cossileth and Steinfeld (17) reported that mastectomized women with breast cancer felt sexually incompetent when being with their husbands and were alienated from their spouses,

and that husbands often either cared about their wives excessively or sometimes avoided sexual intimacy because they felt that their wives might have lost their femininity.

This study aimed to assess the anxiety and depression levels of breast cancer patients who underwent mastectomy yet did not receive any psychiatric treatment in relation to the attitudes of coping with the disease and sociodemographic variables one year after the diagnosis. The reason for the inclusion of patients one year after receiving the diagnosis was to help minimize the effects induced by the initial trauma of the diagnosis, acceptance of the disease, and physical problems experienced during treatment. Sociodemographic variables included age, marital status, level of education, and number of children. In addition, disease stage and disease-related evaluations of the patients were also examined.

Investigating the psychological effects of breast cancer, a common problem in the community, is important for public health as well as for building a base for future research in the field. It is thought that the results of this study could shed light on psychiatric interventions during management and rehabilitation of breast cancer patients and may contribute to further studies.

## METHOD

After receiving approval from the ethics committee, the study was performed in compliance with the revised form (dated 2013) of the Declaration of Helsinki from 1964.

Participants of this study included mastectomized breast cancer patients who were being followed in the Oncology Clinic of Balcali Hospital, belonging to the Faculty of Medicine of Cukurova University, had not received psychiatric treatment, and had completed one year after diagnosis. The research was confined to the thoughts and opinions of breast cancer patients and their responses to the Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), and Coping Inventory (COPE), which constituted the tools for data collection.

A total of 104 subjects were recruited for the study among patients diagnosed with breast cancer one year earlier and had reported to the Oncology Outpatient Clinic of Balcali Hospital between June 5 and July 31, 2017. Eight participants using antidepressant medication were excluded as it may affect coping attitudes. Two other patients discontinued the study. Data of 94 patients were used for the analysis.

The study sample was assumed to reflect the population. After receiving written informed consent, the Personal Information Form, BDI, BAI, and COPE scales were administered through a face-to-face interview. Each interview including the completion of the forms took about 45 minutes to 1 hour. It was assumed that participants answered the questions sincerely and in a way that reflected their actual situation.

**Beck Depression Inventory (BDI):** BDI was developed by Beck in 1961 (18). Validity and reliability studies in Turkey were performed by Hisli (19) and Tegin (20), after which the instrument was used in several studies and in clinical practice. It is a self-report scale consisting of 21 items. Each item corresponds to a behavioral pattern specific to depression. The lowest score for the scale is 0 and the highest score is 63. Low scores on the scale indicate low frequency of depressive symptoms and high scores indicate a higher frequency. The cut-off point of the BDI is accepted to be 17. In our study, patients who scored 17 or higher on the scale were considered to be at a level of depression that would require clinical evaluation.

**Beck Anxiety Inventory (BAI):** BAI was developed by Beck et al. (21). A validity and reliability study for Turkey was performed by Ulusoy et al. (22). The inventory includes some symptoms that people experience during times of anxiety. People are asked to indicate on the scale how much they have been affected by the symptom described in each item over the previous week. The cut-off point of the BAI is accepted to be 17. In our study, those who scored 17 or higher on the scale were considered to be at a level

of anxiety that would require clinical evaluation. Higher scores for total anxiety scores indicate elevated anxiety level.

**COPE:** COPE inventory was developed by Scheier and Weintraub in 1989 (23). A Turkish validity and reliability study was performed by Agargun et al. (24). This inventory aims to investigate how people respond to unsettling events or problems in their daily lives. The responses to each item are rated as “1. I usually don’t do this at all; 2. I usually do this a little bit; 3. I usually do this a medium amount; 4. I usually do this a lot.” The inventory consists of 60 questions and 15 subscales. Each subscale consists of four questions. Each of these subscales provides information about individual coping attitudes: positive reinterpretation and growth, mental disengagement, focus on and venting of emotions, use of instrumental social support, active coping, denial, religious coping, humor, behavioral disengagement, restraint, use of emotional social support, substance use, acceptance, suppression of competing activities, and planning. Higher scores in subscales indicate which coping attitudes are being used more frequently by the individual.

### Statistical Analysis

The data collected by the researcher was analyzed using IBM’s Statistical Package for Social Sciences (SPSS) v22 (IBM Corporation, New York, United States). Descriptive statistics related to the distribution of sociodemographic variables were tabulated. Hypothesis testing was used to investigate if there was a difference between depression and anxiety scores of patients with breast cancer according to sociodemographic variables. Parametric tests were used when the data showed normal distribution. Independent sample t-test was used when there were two independent variables, and ANOVA test was used when there were more than two variables. Tukey’s HSD and Tamhane post hoc multiple comparison tests were used according to the homogeneity of variances to determine which variables explain the

significant difference in ANOVA. Pearson correlation was performed to investigate any association between depression, anxiety, and coping attitude subscales, where the significance was tested by linear regression analysis.

### RESULTS

Analysis of sociodemographic data including age, marital status, childbearing status, education level, and characteristics related with disease stage showed that of the 94 participants, 27.7% were in the age group 35 to 44 years, 37.2% in the age group 45 to 54 years, and 35.1% in the age group 55 to 65 years. The marital status listed 79.8% as married and 20.2% as single. The percentage of participants having children was 85.1, while those having no children constituted 14.9%. Distribution of education level recorded primary school for 53.2%, high school for 36.2%, and a university degree for 10.6% of patients.

The frequency of breast cancer stages in the study population was 30.9% for stage 1, 37.2% for stage 2, 19.1% for stage 3, and 12.8% for stage 4.

The majority of patients (52.1%) responded to the question “What do you attribute your illness to?” choosing “to God/fate”. Other responses were as follows: environmental factors (27.7%), self-blame (10.6%), and hereditary factors (9.6%).

The question “Do you have sufficient information about your illness?” was answered with “I don’t want much information, my physician does what is needed.” by 56.4% of subjects. While 23.4% declared that they wanted more information, 20.2% stated the information that was given was enough.

Nearly half of the patients (49.0%) stated that the behavior of their spouse was unchanged after the illness, while 37.2% indicated closer and 13.8% more distant behavior.

Around two-thirds (67.0) of breast cancer patients declared that the frequency of sexual intercourse they engaged in had decreased after the surgery, whereas 20.2% told that it had increased and 12.8% said that it had remained the same as before.

With a cut-off point of 17 in both BDI and BAI, 16.0% of patients with breast cancer had scores equal to or above the cut-off point for depression and 27.7% for anxiety, respectively.

The relationship of the breast cancer patients' sociodemographic characteristics with their depression and anxiety levels are summarized in Table 1.

Depression and anxiety scores were found to be significantly different by patients' age groups. As shown by post hoc Tamhane test, the difference was driven by the significantly lower depression and anxiety levels of patients in age group 55-65 compared to those in the 35-44 group ( $p=0.006$  and  $p=0.010$ , respectively).

No statistically significant difference was determined by the ANOVA test that was used for analyzing the relationship of depression and anxiety scores with education status ( $p=0.243$  and  $p=0.67$ , respectively).

No statistically significant difference was determined in the independent sample t-test used for analyzing the relationship of depression and anxiety scores with marital status ( $p=0.774$  and  $p=0.203$ , respectively).

No statistically significant difference was determined by independent sample t-test used for analyzing the relationship of depression and anxiety scores with child-bearing status ( $p=0.642$  and  $p=0.17$ , respectively).

Table 2 shows the relationship of depression and anxiety levels with disease process characteristics.

The distribution of factors to which the participants declared that they attributed their illness significantly differed according to their depression scores ( $p=0.042$ ). Depression scores of those who "blamed themselves" for their illness were significantly higher than of those who attributed it to "hereditary factors", as analyzed by post hoc Tukey test. Anxiety scores were not found to differ in relation to the factors to which the participants attributed their condition ( $p=0.292$ ).

The level of knowledge the subjects had about their illness was not significantly associated with their depression scores. On the other hand, anxiety scores of those who wanted more information about their disease were significantly higher than those of other respondents ( $p=0.014$ ).

There was no significant association between mean scores of depression or anxiety and the stages of patients' diseases ( $p=0.258$  and  $p=0.344$ , respectively) or "sexual intercourse after the surgery" ( $p=0.287$  and  $p=0.415$ , respectively).

Anxiety scores were significantly different in terms of the responses to "change in husband's behavior after the disease". This difference was found to be driven by higher anxiety scores of those stating a more distant behavior compared to patients who reported the relationship to be "unaltered" or "becoming closer" ( $p=0.019$ ).

**Table 1: Relationships of depression and anxiety levels with sociodemographic variables**

	n	BDI Score					BAI Score				
		Mean	SD	f	p	Difference	Mean	SD	f	p	Difference
<b>Age, years</b>											
35-44	26	13.6	6.7				16.8	8.0			
45-54	35	9.8	5.1	5.44	0.006	1>3	13.8	6.7	4.87	0.010	1>3
55-65	33	9.3	4.3				11.2				
<b>Level of education</b>											
				<b>f</b>	<b>p</b>				<b>f</b>	<b>p</b>	
Primary	50	11.2	6.1				15.1	8.0			
High school	34	10.7	5.0	1.44	0.243		12.6	5.6	2.78	0.067	
University	10	7.9	4.5				10.1	5.7			
<b>Marital status</b>											
				<b>t</b>	<b>p</b>				<b>t</b>	<b>p</b>	
Single	19	10.3	4.4				11.8	4.6			
Married	75	10.7	5.9	-0.29	0.774		14.2	7.6	-1.28	0.203	
<b>Having a child</b>											
				<b>t</b>	<b>p</b>				<b>t</b>	<b>p</b>	
Yes	80	10.8	5.7				14.1	7.0			
No	14	10.0	5.4	0.467	0.642		11.3	7.8	1.38	0.170	

SD: Standard deviation, BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory. p-values <0.05 were accepted as statistically significant.

**Table 2: Relationships of depression and anxiety levels with disease process variables**

	n	BDI Score					BAI Score				
		Mean	SD	f	p	Difference	Mean	SD	f	p	Difference
<b>To what do you attribute your disease?</b>											
Inheritance	9	7.9	3.5				12.4	4.3			
God/fate	49	10.8	5.2				13.9	6.6			
Environment	26	9.8	6.6	2.8	0.042	4>1	12.3	8.5	1.25	0.294	
Self-blame	10	14.7	4.6				17.2	7.8			
Total	94	10.6	5.6				13.7	7.1			
<b>Do you have sufficient information about your disease?</b>											
Yes, the information my physician provided me is sufficient	19	9.4	5.7				11.3	5.3			
No, I want more information	22	12.0	6.7				17.4	8.6			2>1
I don't want much information; my physician does what is needed.	53	10.5	5.0	1.2	0.308		13.1	6.6	4.5	0.014	2>3
Total	94	10.6	5.6				13.7	7.1			
<b>Behavior of your spouse after the disease</b>											
Remained unaltered	46	10.3	5.4				13.4	6.2			
Kept distance	13	14.1	7.2	2.9	0.055		18.7	9.2			2>1
Got closer	35	9.9	4.9				12.3	6.9	4.2	0.019	2>3
Total	94	10.6	5.6				13.7	7.2			
<b>Disease stage</b>											
1,00	29	9.8	5.4				12.1	6.2			
2,00	35	11.4	5.4				14.3	6.8			
3,00	18	9.2	6.5	1.4	0.258		13.3	7.6	1.1	0.344	
4,00	12	12.7	5.1				16.3	9.3			
Total	94	10.6	5.6				13.7	7.1			
<b>Sexual intercourse after the surgery</b>											
Increased	19	10.3	4.4				11.8	4.6			
Decreased	63	11.2	5.9	1.3	0.287		14.0	7.7	0.9	0.415	
Unaltered	12	8.4	5.5				14.9	7.2			
Total	94	10.6	5.6				13.7	7.1			

SD: Standard deviation, BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory. p values <0.05 were accepted as statistically significant.

The relationship between coping attitudes and sociodemographic variables is shown in Table 3.

No statistically significant difference was detected between subgroups of marital status in the sub-dimensions of COPE Inventory.

The childbearing status category differed significantly in the restraint sub-dimension of the COPE Inventory, where those with children were found to be less likely to use a restraint attitude than women who had not given birth ( $p=0.028$ ).

The association between level of education and sub-dimensions of COPE showed that the mean score of religious coping was significantly higher among primary school graduates than in university graduates ( $p=0.02$ ). In addition, the mean score in the humor sub-dimension

was significantly higher among university graduates than in high school graduates ( $p=0.04$ ).

The knowledge about the disease differed significantly in the "positive re-interpretation" and "planning" sub-dimensions of coping attitudes. Tukey HSD test showed this difference to originate from higher "positive re-interpretation" and "planning" scores among those who "did not want much information and left it to their physician" compared to scores in patients who "considered the information given by their physician as sufficient" ( $p=0.045$  and  $p=0.01$ , respectively) (Table 3).

Pearson correlation analysis revealed a significant and highly positive association between depression and anxiety ( $p<0.05$ ;  $r=0.68$ ). Depression was further

**Table 3: Relationship of some coping subdomains with different sociodemographic and disease process variables**

Coping attitudes		COPE Inventory Score					Difference
		n (94)	Mean	SD	t	p	
<b>Having children</b>							
<b>Restraint</b>	Yes	80	10.3	1.6	-2.23	0.028	
	No	14	11.4	1.5			
<b>Level of education</b>					<b>f</b>	<b>p</b>	
<b>Religious coping</b>	Primary	50	15.4	1.8	3.97	0.020	1>3
	High school	34	15.2	1.0			
	University	10	13.7	2.7			
<b>Humor</b>	Primary	50	7.4	3.7	3.34	0.040	3>2
	High school	34	6.8	3.1			
	University	10	10.0	3.0			
<b>Do you have sufficient information about your disease?</b>					<b>f</b>	<b>p</b>	
<b>Positive reinterpretation and growth</b>	Yes, the information my physician provided me is sufficient	19	15.3	1.1	3.21	0.045	1>3
	No, I want more information	22	14.1	1.9			
	I don't want much information; my physician does what is needed.	53	14.4	1.4			
<b>Planning</b>	Yes, the information my physician provided me is sufficient	19	14.3	1.4	4.9	0.010	1>3
	No, I want more information	22	13.1	2.2			
	I don't want much information; my physician does what is needed.	53	12.7	2.1			

SD: Standard deviation, p-values <0.05 were accepted as statistically significant.

found to be negatively correlated with several coping attitudes, including positive re-interpretation, mental disengagement, active coping, denial, and suppression of competing activities (Table 4). Using BDI as the dependent variable, linear regression analysis showed that BAI, mental disengagement, and active coping were independent predictors of BDI ( $p < 0.001$ ,  $p = 0.011$ , and  $p = 0.008$ , respectively;  $R^2 = 0.544$ ) (Table 5).

Anxiety was detected to be positively correlated with the use of emotional social support ( $p < 0.05$ ,  $r = 0.23$ ) (Table 4). Logistic regression analysis revealed scores of BDI and use of emotional social support to be independent factors to determine BAI scores ( $p < 0.001$  and  $p = 0.038$ , respectively;  $R^2 = 0.472$ ) (Table 5).

## DISCUSSION

This study examined depression and anxiety levels and coping attitudes of mastectomized breast cancer patients diagnosed one year previously.

Among the participants, 16.0% and 27.7%, respectively, had symptoms of depression and anxiety that required clinical evaluation. Furthermore, depression and anxiety showed highly significant positive association in the study population. Karabulutlu et al. (25) reported anxiety and depression rates of 61.5% and 81.3%, respectively, in cancer patients. Jadoon et al. (26) reported a co-incidence of depression and anxiety in 66.0% of individuals with cancer. In addition, 20.0-50.0% of cancer patients reportedly had mild or severe depression and 15.0% had major depressive disorder. Studies show increased prevalence of depression and anxiety in patients with cancer. These findings are higher than those observed in our study. The fact that the current study only included breast cancer patients who had not required psychiatric therapy and completed one year after the diagnosis might explain the lower rates of depression and anxiety. Nevertheless, observed rates of anxiety and depression symptoms were remarkable in these

**Table 4: Correlation analysis of the association between depression, anxiety, and coping sub-dimensions among breast cancer patients**

	Depression	Anxiety	PRG	MD	FOVE	UISS	AC	Denial	RC	BD	Restraint	UESS	SU	Acceptance	SCA	Planning	Humor
<b>Depression</b>	r 1																
<b>Anxiety</b>	r 0.68**	1															
<b>PRG</b>	r -0.29**	-0.16	1														
<b>MD</b>	r -0.37**	-0.17	0.25*	1													
<b>FOVE</b>	r 0.11	0.15	0.008	0.07	1												
<b>UISS</b>	r -0.03	0.01	0.13	0.19	0.2	1											
<b>AC</b>	r -0.36**	-0.15	0.55**	0.32**	0.04	0.02	1										
<b>Denial</b>	r -0.31**	-0.14	0.23*	0.47**	-0.02	0.17	0.29**	1									
<b>RC</b>	r 0.16	0.18	0.24*	0.11	0.11	0.21*	-0.03	0.19	1								
<b>BD</b>	r 0.2	0.2	-0.28**	-0.16	0.05	0.15	-0.32**	-0.004	-0.02	1							
<b>Restraint</b>	r -0.13	0.05	0.03	0.24*	0.04	0.19	0.19	0.33**	0.02	0.33**	1						
<b>UESS</b>	r 0.11	0.23*	-0.08	0.23*	0.39**	0.46**	-0.16	0.05	0.28**	0.14	0.13	1					
<b>SU</b>	r -0.1	-0.07	-0.01	-0.05	0.05	-0.03	-0.02	0.06	-0.01	-0.06	0.02	0.02	1				
<b>Acceptance</b>	r -0.03	0.09	0.03	0.19	0.15	0.24*	0.15	0.15	0.09	0.12	-0.02	0.28*	-0.13	1			
<b>SCA</b>	r -0.23*	-0.04	0.13	0.17	0.17	0.29**	0.33**	0.17	-0.11	0.30**	0.40**	0.17	-0.01	0.2	1		
<b>Planning</b>	r -0.29**	-0.16	0.53**	0.29**	-0.03	0.14	0.62**	0.16	-0.05	-0.19	0.08	-0.17	-0.02	0.01	0.16	1	
<b>Humor</b>	r -0.24*	-0.05	0.1	0.21*	0.02	0.18	0.30**	0.37**	0.21*	0.11	0.23*	0.19	0.1	0.23*	0.27**	0.1	1

PRG: Positive reinterpretation and growth, MD: Mental disengagement, FOVE: Focus on and venting of emotions, UISS: Use of instrumental social support, AC: Active coping, RC: Religious coping, BD: Behavioral disengagement, UESS: Use of emotional social support, SU: Substance use, SCA: Suppression of competing activities.

\*p<0.05 (the correlation was significant at 0.05 level), \*\*p<0.01 (the correlation was significant at 0.01 level), for all other values p<0.001

**Table 5: Variables that predict BDI and BAI total scores in linear regression analyses**

	p	Beta	95% confidence interval for beta	
<b>Linear regression analysis for BDI</b>				
Constant	<0.001	17.862	11.213	24.510
BAI	<0.001	0.481	0.370	0.593
Mental disarrangement	0.011	-0.598	-1.055	-0.141
Active coping	0.008	-0.576	-0.995	-0.156
<b>Linear regression analysis for BAI</b>				
Constant	0.951	0.145	-4.584	4.875
BDI	<0.001	0.840	0.648	1.032
Use of emotional social support	0.038	0.388	0.022	0.754

R<sup>2</sup>=0.544 for BDI; R<sup>2</sup>=0.472 for BAI. BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory

breast cancer patients though they did not seek psychiatric advice and consequently did not receive treatment. Yildirim's (27) study in 2009 reported that the risk for anxiety and depression was high from the first diagnosis of breast cancer and still persisted at the end of first year.

In the current study, depression scores of patients significantly differed according to the reasons to which the patients attributed their illness. As expected,

depression scores of those who blamed themselves were higher than in patients who attributed their condition to inheritance.

Body image, sex role function, sexual functions, and reproductive ability, the four major components of sexual health, may be damaged in patients with cancer due to the disease and specific treatment modalities. Body image is an important dimension that can become different depending on a person's

age, health condition, and the disease experience. Firstly, it is thought that the loss of body parts related to femininity could greatly alter a woman's body image (28). In our study, changes in the sexual life of patients who had undergone mastectomy due to breast cancer were not significantly associated with depression and anxiety. However, it should be borne in mind that the possibility that participants may experience difficulties in speaking openly and sincerely about sexuality may also have contributed to this finding.

Cassileth et al. (29) examined the extent of having knowledge and participating in medical decisions. It was determined that information and active participation are linked with the patients' behavior and beliefs. Information-seeking was found to be more common among young patients or those with a recent diagnosis or and higher level of education. Patients who wanted to participate in the treatment decision were reported to be much more hopeful than others, open for communication, and willing to be maximally informed about their disease. These findings are consistent with our results. Patients who considered treatment as positive had lower depression scores. When the anxiety scores were evaluated regarding information about the disease, those having complained about a lack of knowledge had higher scores than those groups that were satisfied with the available information. In line with our study, Montgomery et al. (30) reported that better patient counseling reduced psychological problems and improved compliance.

When knowledge about the disease was assessed in terms of dimensions of coping attitude, it was shown that those who "did not want much information and left it to their physician" had lower scores of "positive re-interpretation" and "planning" than patients who "considered the information given by their physician as sufficient". This suggests that patients make more positive assessments about their illness when they are satisfied with the information received.

Our literature search showed that a lower level of education is a risk factor for emotional problems such as anxiety and depression among cancer patients. In

our study, the anxiety and depression scores of patients with breast cancer did not significantly differ in relation with marital, educational, and child-bearing status. However, it was determined that younger patients had significantly higher levels of anxiety and depression than the elderly. This was attributed to the fact that breast cancer may have more destructive effects on sexuality, motherhood, and body image with greater losses in younger women than in the elderly. Kaplan et al. (31) reported an association of lower educational level with higher levels of anxiety and depression. McCall et al. (32) stated that a lower level of education constituted a risk for major depressive disorder. Arslan (33) reported that living standards increased as the level of education rose. Unlike these findings, our study did not find any effect of the level of education on anxiety and depression in patients with breast cancer. Bottomly et al. (34) stressed that a low level of education in cancer was a risk factor for emotional problems such as anxiety and depression, determining a correlation. Pillay et al. (35) also reported an association of low level of education with higher levels of anxiety and depression in cancer patients. On the other hand, Aydogan et al. (36) found no significant relationship between educational level and anxiety and depression levels in cancer patients. However, the number of participants with low educational level was very small in their study. The data in our study have shown that the level of education in breast cancer patients did not affect anxiety and depression levels. This might be partially explained by the fact that we included only breast cancer patients in our study as well as by a greater recognition of this type of cancer in terms of diagnosis, treatment, and risks on the part of individuals from all levels of education thanks to awareness-raising activities in society.

Primary school graduates had a significantly higher mean score in the religious coping sub-dimension than university graduates. In addition, the attitude of humor was significantly more likely to be used by university graduates than by high school graduates.

We found a strong negative correlation of depression with "mental disengagement" and "active coping" and a

positive relationship of anxiety with “use of emotional social support”. A negative association of mental disengagement with higher BDI scores indicates that depressive thoughts present in breast cancer patients prevent them from coping with negative thoughts and using constructive and “active coping”. On the other hand, patients with higher BAI scores appear to cope with the disease by sharing their feelings with their social environment and seeking emotional support. A study by Aydogan et al. (36) reported a positive correlation of BAI and BDI scores of any cancer patients with their “focus on and venting of emotions” and “behavioral disengagement” attitude scores. The difference of our findings from the mentioned study might be explained by the fact that we only included breast cancer cases and female patients.

In conclusion, this study showed a positive association between depression and anxiety in mastectomized breast cancer patients where the diagnosis was established one year earlier. Anxiety scores were higher in subjects who wanted more information about their disease and who thought that their spouse had become more distant than before. The disease stage, change of sexual intercourse behavior after surgery, marital status, childbearing status, and level of education did not influence anxiety or depression scores. The age range of 35-44 years had a higher mean depression score than patient aged 55-65 years. It is understood that patients having given birth were more likely to use restraint, primary school graduates more likely to use religious coping, university graduates humor, and patients who felt sufficiently informed about their disease were more likely to use positive re-interpretation and planning attitudes. In addition, there was a strongly negative

association of depression with mental disengagement and active coping and a positive association of anxiety with use of emotional social support.

In light of these findings, we conclude that among breast cancer patients who had received one year of treatment during which they did not need or were not referred to psychiatric aid, 27.7% had anxiety that required clinical evaluation and 16.0% had depressive symptoms. Therefore, consideration of psychological effects of the disease, and a prioritization of psychosocial interventions and therapeutic approaches focusing on coping attitudes alongside cancer treatment may prevent such patients from developing depression and anxiety.

Contribution Categories		Author Initials
Category 1	Concept/Design	S.U., R.G.
	Data acquisition	S.C., R.G., M.E.D.
	Data analysis/Interpretation	M.E.D., S.C., R.G.
Category 2	Drafting manuscript	S.C., M.E.D., R.G.
	Critical revision of manuscript	S.U., M.E.D., S.C.
Category 3	Final approval and accountability	M.E.D., S.U., R.G., S.C.
Other	Technical or material support	S.U., S.C., R.G.
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## REFERENCES

1. Tokgoz G, Yalug I, Ozdemir S, Yazici A, Uygun K, Aker T. Prevalence of major depression in patients with cancer and related factors. *Anatolian Journal of Psychiatry* 2008; 9:59-66. (Turkish)
2. Elbi-Mete H, Onen O. Depression in cancer patients. *Duygudurum Bozukluklari Dizisi* 2001; 4:184-191. (Turkish)
3. Berard RM. Depression and anxiety in oncology: the psychiatrist's perspective. *J Clin Psychiatry* 2001; 62(Suppl.8):58-61.
4. Kelsey JL, Fischer DB, Holford TR, LiVoisi VA, Mostow ED, Goldenberg IS, White C. Exogenous estrogens and other factors in the epidemiology of breast cancer. *J Natl Cancer Ins* 1981; 67:327-333.

5. Ferrell, BR, Grant M, Funk B, Otis-Green S, Garcia N. Quality of life in breast cancer: Part I. Physical and social well-being. *Cancer Nurs* 1997; 20:398-408. **[CrossRef]**
6. Mills ME, Sullivan K. The importance of information giving for patients newly diagnosed with cancer: a review of the literature. *J Clin Nurs* 1999; 8:631-642. **[CrossRef]**
7. Kocaman N. Psychosocial reactions to medical illness. *Journal of Istanbul Faculty of Medicine* 2008; 71:52-58. (Turkish)
8. Tunel M. Anxiety and depression levels in patients with breast cancer before and after surgical treatment. Thesis for Medical Specialty, Adana, Cukurova University Faculty of Medicine, 2011. (Turkish)
9. Kissane DW, Clarke DM, Street AF. Demoralization syndrome-a relevant psychiatric diagnosis for palliative care. *J Palliat Care* 2001; 17:12-21.
10. Jia Y, Li F, Liu YF, Zhao JP, Leng MM, Chen L. Depression and cancer risk: a systematic review and meta-analysis. *Public Health* 2017; 149:138-148. **[CrossRef]**
11. Tezcan E. Differential diagnosis of depression. *Duygudurum Bozukluklari Dizisi* 2000; 2:77-98. (Turkish)
12. McDonnell GA, Salley CG, Barnett M, DeRosa AP, Werk RS, Hourani A, Hoekstra AB, Ford JS. Anxiety among adolescent survivors of pediatric cancer. *J Adolesc Health* 2017; 61:409-423. **[CrossRef]**
13. Knotkova H, Crawford Clark W, Mokrejs P, Padour F, Kuhl J. What do ratings on unidimensional pain and emotion scales really mean? A Multidimensional Affect and Pain Survey (MAPS) analysis of cancer patient responses. *J Pain Symptom Manage* 2004; 28:19-27. **[CrossRef]**
14. Teunissen SC, de Graeff A, Voest EE, de Haes JC. Are anxiety and depressed mood related to physical symptom burden? A study in hospitalized advanced cancer patients. *Palliat Med* 2007; 21:341-346. **[CrossRef]**
15. Amichetti M, Caffo O, Richetti A, Zini G, Rigon A, Antonello M, Roncadin M, Coghetto F, Valdagni R, Fasan S, Maluta S, Di Marco A, Neri S, Vidali C, Panizzoni G, Aristei C. Subclinical ductal carcinoma in situ of the breast: treatment with conservative surgery and radiotherapy. *Tumori* 1999; 85:488-493. **[CrossRef]**
16. Rakovitch E, Franssen E, Kim J, Ackerman I, Pignol JP, Paszat L, Pritchard KI, Ho C, Redelmeier DA. A comparison of risk perception and psychological morbidity in women with ductal carcinoma in situ and early invasive breast cancer. *Breast Cancer Res Treat* 2003; 77:285-293. **[CrossRef]**
17. Cassileth BR, Steinfeld AD. Psychological preparation of the patient and family. *Cancer* 1987; 60(Suppl.3):547-552. **[CrossRef]**
18. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. *Arch Gen Psychiatry* 1961; 4:561-571. **[CrossRef]**
19. Hisli N. A study on the validity of Beck Depression Inventory. *Turkish Journal of Psychology* 1988; 6:118-122. (Turkish)
20. Tegin B. Cognitive processes in depression: a review based on Beck's model. *Turkish Journal of Psychology* 1987; 6:116-121. (Turkish)
21. Beck AT, Epstein N, Brown G, Steer RA. An inventory for measuring clinical anxiety: psychometric properties. *J Consult Clin Psychol* 1988; 56:893-897. **[CrossRef]**
22. Ulusoy M, Sahin NH, Erkmen H. Turkish version of the beck anxiety inventory: psychometric properties. *Journal of Cognitive Psychotherapy* 1998; 12:28-35.
23. Carver CS, Scheier MF, Weintraub JK. Assessing coping strategies: a theoretically based approach. *J Pers Soc Psychol* 1989; 56:267-283. **[CrossRef]**
24. Agargun MY, Besiroglu L, Kiran UK, Ozer OA, Kara H. The psychometric properties of the COPE inventory in Turkish sample: a preliminary research. *Anatolian Journal of Psychiatry* 2005; 6:221-226. (Turkish)
25. Karabulutlu EY, Akyil R, Karaman S, Karaca M. Investigation of sleep quality and psychological problems in cancer caregivers. *Turkish Journal of Oncology* 2013; 28:1-9. (Turkish)
26. Jadoon, NA, Munir W, Shahzad MA, Choudhry ZS. Assessment of depression and anxiety in adult cancer outpatients: a cross-sectional study. *BMC Cancer* 2010; 10:594. **[CrossRef]**
27. Yildirim Y, Ozgur Ozyilkan. Thromboembolic complications of cancer and management. *Acta Oncologica Turcica* 2009; 42:86-91. (Turkish)
28. Key T, Appleby P, Barnes I, Reeves G. Endogenous sex hormones and breast cancer in postmenopausal women: reanalysis of nine prospective studies. *J Natl Cancer Inst* 2002; 94:606-616. **[CrossRef]**
29. Cassileth BR, Zupkis RV, Sutton-Smith K, March V. Information and participation preferences among cancer patients. *Ann Intern Med* 1980; 92:832-836. **[CrossRef]**
30. Montgomery C, Lydon A, Llyoyd K. Psychological distress among cancer patients and informed consent. *J Psychosom Res* 1999; 46:241-245. **[CrossRef]**
31. Kaplan GA, Roberts RE, Camacho TC, Coyne JC. Psychosocial predictors of depression. Prospective evidence from human population laboratories studies. *Am J Epidemiol* 1987; 125:206-220. **[CrossRef]**

32. McCall NT, Parks P, Smith K, Pope G, Griggs M. The prevalence of major depression or dysthymia among aged medicare fee-for-service beneficiaries. *Int J Geriatr Psychiatry* 2002; 17:557-565. **[CrossRef]**
33. Arslan S. Evaluation of Quality of Life in Cancer Patients. Master Thesis, Health Sciences Institute of Ataturk University, Department of Surgical Nursery, Erzurum, 2000. (Turkish)
34. Bottomley A. Depression in cancer patients: a literature review. *Eur J Cancer Care* 1998; 7:181-191. **[CrossRef]**
35. Pillay AL, Sargent CA. Relationship of age and education with anxiety, depression and hopelessness in a South African community sample. *Percept Mot Skills* 1999; 89:881-884. **[CrossRef]**
36. Aydogan U, Doganer YC, Borazan E, Komurcu S, Kocak N, Ozturk B, Ozet A, Saglam K. Relationship between depression and anxiety levels and attitudes of coping with disease in cancer patients. *Turkish Journal of Family Practice* 2012; 16:55-60. (Turkish) **[CrossRef]**