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Research Article

Relationship Between Cancer Response Style, Metacognition, and Anxiety of Breast Cancer

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Abstract: One of the main purposes is to examine the relationship between cancer response style, metacognition, and anxiety of newly diagnosed and remission breast cancer patients based on the metacognitive model. Second is to evaluate difference between newly diagnosed and remission breast patients in manner of cancer response style, metacognition, and anxiety levels. A total of 110 early-stage breast cancer patients *(56 newly diagnosed, 54 in remission)* from one of the government hospital in Türkiye, Muğla were enrolled from November 2022 to August 2023. The participants *completed sociodemographic and medical information, the Metacognition Scale (SBS-30), Cancer Response Style Scale, and Generalized Anxiety Scale-Revised (GADS-R).* The average scores of the participants on the Generalized Anxiety Scale were determined as 1591,12 ± 282,62, in those who were in newly diagnosed and was determined 1284.44 ± 445.34 in remission. Anxiety has a positive correlation with *metacognitive activity and emotion-oriented strategies (P<0.05);* while fighting spirit and distrust of cognitive activities were negatively correlated (P < 0.05). Anxiety was a common phenomenon in newly diagnosed breast cancer patients and average during the remission stage. In addition, both cancer responses and metacognitive beliefs had a direct and indirect association with the occurrence and development of anxiety. Moreover, positive, and negative metacognitions had different mechanisms on anxiety in patients with breast cancer.

Keywords: Breast Cancer, Anxiety, Metaognitive Beliefs, Cancer Response Style

1. Introduction

Cancer is an increasingly important disease worldwide (WHO; Siegel et al., 2023, p. 17). Breast cancer, which is referred to as the female gender by nature, is one of the common types of cancer that can occur as a result of a wide variety of factors such as age, genetic influence, hormones, negative vital habits and environmental variables, has its own symptoms and stages, and can spread to the surrounding tissues in the later stages of the disease (Hsieh et al., 1990, p. 796). Breast cancer ranks first among all types of cancer seen in women in our country (T.R. Ministry of Health, 2020).

Women diagnosed with breast cancer experience some mandatory changes in their body image, work and social life (breast removal, pain, uncontrolled weight loss, hair loss, quitting, pain and limitation of movement, etc.) related to the course and treatment of the disease (Harcourt et al., 2003; Ghazal et al., 2000; Campbell-Enns & Woodgate, 2015). These external changes and processes, which can be observed relatively clearly, unsurprisingly create emotional difficulties and fluctuations in women (Babayiğit, 2023, p. 260). Moreover, socially, the relationship of the breast with being a woman and mother, and the social roles assigned to women, can be shown as an additional reason for the strengthening of psychological distress (Tarhan, 2022). At almost every stage of breast cancer, changes in appetite and sleep, visible anxious thoughts and associated avoidance have been noticed in women (Williams & Dale, 2006, p. 372; Jassim et al., 2015, p. 2; Matthews et al., 2014, p. 250).

The first noticeable psychological reactions in women diagnosed with breast cancer are mostly anxiety, fear, and anger. Conditions such as restlessness, hopelessness, depression and preoccupation of the mind with the threat are considered quite meaningful, understandable and natural for this group of patients who face a concrete life threat and uncertainty due to evolutionary reasons (Okanlı, 2004, p. 3; Stark and House, 2000, p. 1263). On the other hand, the resulting emotions and anxious thoughts become chronic, break away from objectivity, and begin to create deterioration and restrictions in functionality in the person's life. It is observed that women diagnosed with breast cancer in clinical

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settings experience mental health problems such as adjustment disorders, mood disorders, anxiety and long-term grief with breast cancer at different rates and severity in relation to the disease itself and the treatment process (İzci et al., 2016, p. 94). Psychological problems that are observed intensely; drew attention to the importance of psychological interventions that should be carried out simultaneously with medical treatment (Aksan, 2021, p. 34; Barsevick et al., 2002, p. 73; Tunç, 2021, p. 34).

Anxiety during breast cancer; is the most common psychological problem that is expressed at almost every stage after depressive symptoms and diagnosed in the clinical setting (Ateşçi et al., 2003, p. 145; Lueboonthavatchai, 2007; Yildirim et al. 2009, p. 175; Gallagher et al., 2002; Tsaras et al. 2018). Anxiety, as a disorder, refers to the state of experiencing an anxiety-related excess (American Psychiatric Association, 2015). In the case of pathological anxiety, intense physical, mental and behavioral compression and strain are observed in people (Türkçapar, 2004, p. 13). Even in cases where the person does not have a concrete problem, it can be observed that he has a constant worry that "something" will happen, which is often reflected in behavior. From this point of view, in addition to the physical problems and pain experienced with breast cancer, the symptoms of anxiety also create an extra difficulty in the life of the person (Akçay, 2019, p. 2; Kocaman et al., 2013, p. 155). In line with this need, over time, possible factors that cause exacerbation and settlement have begun to be emphasized in order to alleviate various mental health problems that occur in biological and intense chronic diseases such as cancer (Kanmaz, 2019, p. 20; Lueboonthavatchai, 2007; Turgut et al., 2009, p. 92; Zimmermann et al., 2007, p. 225). In this study, breast cancer and anxiety that arises and/or intensifies during the process is especially emphasized. Throughout the study, dominant responses to cancer (actions) and how the disease is perceived/interpreted (thoughts) were two possible variables that were thought to influence ongoing anxiety.

The first factor seen as a determinant of chronic anxiety that occurs during illness is cancer response styles (Knowles et al., 2011; Güleç & Büyükkınacı, 2011, p. 349; Geyikçi et al., 2018, p.246). Cancer often indicates a long "process" (Savaş, 2023). Therefore, people diagnosed with cancer can have a wide range of emotional and situational reactions to the disease in different periods. In addition, these responses to cancer can vary depending on many factors, including the obstacles people face throughout the process and how they cope with the disease, social support, temperament differences, and environmental variables. This situation carries the way they meet cancer and the psychological process experienced to a very subjective and complex dimension. On the other hand, to regulate this confusion as much as possible, the response styles to cancer are basically divided into two as emotion-oriented (e.g., emphasizing anger) or combative, action-oriented (e.g., actively seeking functional solutions). These two styles can be used together from time to time, and one style is usually more dominant in the person (Aksan & Gizir, 2019, p. 643). Studies pointed out that people who cope with difficult processes with an emotion-oriented focus and are in a state of inaction are able to use dysfunctional coping strategies more often than people who are activated by the disease and meet the disease with a fighting spirit; mentioned that these people are in the high-risk group in terms of experiencing mental health problems (Aydoğan et al., 2012; Karabulutlu et al., 2010; Knowles et al., 2011; Saniah & Zainal, 2010; Wang et al., 2012).

In addition to responses to cancer, another major theme in the research is metacognition, which highlights mental activities in the frequency and severity of anxiety observed in people throughout the process. This word, which is a combination of the words meta (above, after) and cognition (cognition), represents a mechanism above cognition; It is defined as cognition about cognition. For example, *"Will my disease recur?"* is a cognition; *"My illness will relapse because I keep thinking about whether my illness will recur"* is an example of a thought about a thought. Metacognitions also encompass metacognitive beliefs, which are divided into positive and negative beliefs. Positive metacognitive belief; Beliefs that thinking about a cognition that comes to mind will benefit the person themselves or the situation (e.g., *"I need to keep thinking about anxious thoughts because it will protect me from possible cancer recurrence."*); When pointing out, the negative ones represent beliefs that follow a thought that comes

to mind or that not being able to eliminate it will harm the person (e.g., *"I will get sick because I think about the disease too much."*). Due to the effort to make sense of what is happening, a wide variety of metacognitive beliefs can appear in people with fatal diseases such as cancer. Patients mostly tend to attribute the disease to an event, a person, or themselves. This situation also applies to what goes through the mind of the person and the emotions he feels from time to time. People may believe that they are sick because of their feelings or thoughts. Due to their metacognitive beliefs, patients may think for a long time about a cognition that comes to their mind (rumination) or engage in various mental and behavioral avoidances and actions (avoidance, coercion) to eliminate this thought (Fisher et al., 2019, p.2; Cook et al., 2015, p. 208). In this way, metacognitions can be "fed" and reinforced by metacognitive beliefs. In this cycle, metacognitive beliefs prolong mental preoccupation and can lead to a variety of dysfunctional, repetitive, and compulsive behavior patterns. Although metacognitive beliefs can only exist on the mental plane, when behaviors and beliefs are reinforced, coping styles can be negatively affected and the process can enter a vicious circle (Ng et al., 2019).

In studies on breast cancer, it has been found that there is a noticeable increase in women's metacognitive activities from the first moment of diagnosis; It has been determined that new mental and operational habits based on beliefs have begun to form (Cook et al., 2015, p.207; Jektaji & Khalkali, 2015; Elzami et al., 2015, p. 94). Metacognitive beliefs and metacognitive activity intensity are effective in psychological strains that occur during current studies based on various chronic diseases (cardiovascular diseases, Parkinson's, cancer, etc.); significant relationships have been demonstrated between the two in a way that confirms the model and at considerable rates (Yazar & Tolan, 2020, page 172; Anderson et al., 2019, p.1; Thewes et al., 2013). The effect of metacognitive processes on anxiety and various mental health problems experienced in breast cancer has just begun to be investigated, and studies in this area are still in the minority (Cook et al., 2014, p. 52; Yazar & Tolan, 2020, p. 172; Anderson et al., 2019, p. 1).

Therefore, this study had two main objectives: (1) to evaluate the relationship between cancer response style, metacognition, and anxiety of newly diagnosed and remission breast cancer patients based on the metacognitive model. (2) To evaluate the difference in cancer response style, metacognition, and anxiety levels between newly diagnosed and remission patients.

2. Materials and Methods

2.1. Participants and procedure

The type of research is in the quantitative and relational (correlational) survey model. Baseline data from cancer patients (*n*=110), *56 newly diagnosed and 54 in remission breast cancer patients,* was drawn from correlational research exploring cancer response style, metacognition, and anxiety.

Participants were recruited from a National Hospital in the South of Türkiye. Including criteria were women, diagnosed breast cancer, between the ages of 23 and 65, and being able to read and write Turkish. Exclusion criteria were having significant cognitive impairment or psychosis (as assessed by the clinician), current psychological treatment. Participants who met the specified criteria were randomly selected and participation was voluntary. Participants provided written and informed consent. This study was approved by the Ethics Committee of Istanbul Kent University (Reference Number: 10504099). Informed consent was obtained from all individual participants included in the study. The research was conducted in accordance with the Declaration of Helsinki.

2.2. Measures

Sociodemographic and medical information form, Response to cancer (MAC), metacognition questionnaire, and general anxiety scale were recruited from participants.

2.2.1. Sociodemographic and medical information form

Sociodemographic information (e.g. How old are you? Where do you live? What is your education level? What is your profession? Are you working currently?) and medical information (e.g. What stage are you in breast cancer? Are you satisfied with the medical treatment you are receiving? Do you feel that you are adequately informed about your illness? Do you have a psychological disorder that has been diagnosed or continues during this process? Do you have any other chronic diseases?) were included in the form.

2.2.2. Metacognitions questionnaire 30 (MCQ-30)

MCQ-30 was developed by Wells and Cartwright (2004) and psychometric studies in Turkish was completed by Tosun and Irak (2008). It is a 4-point Likert type scale with 30 items in 5 subscales: positive metacognitive beliefs about worry, negative metacognitive beliefs concerning uncontrollability and danger, cognitive confidence, beliefs concerning the need for control, and cognitive self-consciousness. The MCQ-30 has one positive belief subscale, while the remaining subscales evaluate more negative metacognitive belief domains. Higher scores indicate higher levels of problematic metacognitive beliefs. Cronbach's alpha reliability coefficient was found to be 0.86.

2.2.3. Generalized anxiety scale- revised (GADS-R)

GADS-R) was developed by Wells in 2009, and psychometric studies in Turkish was completed by Gündüz, et al (2021). The scale included the severity and frequency of anxiety, frequency of coping strategies for prevention, anxiety avoidance and evaluates the frequency of positive and negative metacognitive beliefs. In the assessment, it is accepted that anxiety levels increase as the total score obtained. The first 16 items are with 0-8 Likert type; The last 12 items are evaluated with a scoring system between 0-100. To calculate the total score, the scoring of the first 16 items was converted to scoring between 0-100 (the scores of the first 16 items were increased to 12.5 times). At the end, 28 items were collected to find the total score.

2.2.4. Cancer response style scale (MAC)

MAC was used to recognize the patient's reactions to cancer. MAC was developed by Watson et al. in 1989, and Natan (2000) conducted Turkish validity and reliability. It is a 4 point Likert type scale (1-4), a total of 40 items with five subscales that measure five types of response: fighting spirit (16 items- 4, 5, 6, 11, 13, 16, 18, 20, 26, 27, 28, 31, 32, 34, 39 and 40); helpless/hopelessness (6 items- 2, 9, 17, 23, 25 and 36); anxious preoccupation (9 items- 1, 3, 10, 14,19, 21, 22, 29 and 37); fatalism (8 items- 7, 8, 12, 15, 24, 30, 33 and 35); and positive avoidance (1 item- 38). Scores for the sub- scales are calculated by summing the answers for the assigned items. Higher scores indicate that the subscale reaction is experienced more. Cronbach's alpha reliability coefficients of the subscales were found to be between .72 and .58.

2.3. Statistical analysis

The data analysis software included SPSS 27.0. First, descriptive analyses were conducted to characterize the sociodemographic and medical information, and the average scores for cancer response style, metacognition, and anxiety. Secondly, the correlation among metacognition, response styles, and anxiety was tested through the utilization of Spearman correlation. The analysis of the data was performed at 95% confidence interval (p=0.05).

3. Results

3.1. Descriptive statistics

This study included 110 breast cancer patients who were newly diagnosed and remission in cancer, from one national hospital. All participants were female, and their mean age was 44.73 ± 9.23. The majority was currently working (54,6%) with college or above education (40%). Approximately 50.9%

of the patients within newly diagnosed in stage of breast cancer I and II and 49.1% of participants treatment was in remission. Descriptive for sociodemographic and clinical information are presented in Table 1.

Table 1

Participant Sociodemographic and Medical Information Form

	X ± SS	**Min - Max**
Age	44.73 ± 9.23	23 - 64
	N	**%**
Education Level		
Primary school	11	10,0
High Education	30	27,3
College	44	40,0
MSc	21	19,1
PhD	4	3,6
Employment Status		
Occupied	60	54,5
Nonoccupied	44	40,0
Retired	6	5,5
Disease Stage		
Newly Diagnosed	56	50,9
In Remission	54	49,1

3.2. Correlational analysis

Table 2 displays the information on cancer response style of participants. There were significant differences between groups on helplessness, anxious preoccupation, avoidance, fatalism; whereas there was no significant difference on fighting spirit. Newly diagnosed cancer patients have higher cancer response styles of helplessness (11,5 %), anxious preoccupation, (28,0 %), avoidance (3,1%), fatalism (23,0%), in comparison to in remission patients. On the other hand, there is no significant difference in using fighting spirit between newly diagnosed and in remission patients.

Table 2

Cancer Response Style Scale Scores of Participants

	Disease Stage	**N**	**X ± SS**	**M (Min - Max)**	**Statistics**
Desperation/Hopelessness	Newly Diagnosed	56	12.20 ± 5.04	11.5 (6 - 23)	Z=-3.864 **p=0.000***
	In Remission	54	8.72 ± 3.42	7.0 (6 - 21)	
Anxious Waiting	Newly Diagnosed	56	28.34 ± 4.33	28.0 (16 - 35)	Z=-6.012 **p=0.000***
	In Remission	54	22.02 ± 4.91	22.0 (12 - 33)	
Denial/Avoidance	Newly Diagnosed	56	2.79 ± 1.14	3.0 (1 - 4)	Z=-4.922 **p=0.000***
	In Remission	54	1.69 ± 0.89	1.0 (1 - 4)	
Fatalism	Newly Diagnosed	56	22.20 ± 3.42	23.0 (11 - 28)	Z=-6.725 **p=0.000***
	In Remission	54	4.36 ± 16.31	16.5 (10 - 32)	
Fighting Spirit	Newly Diagnosed	56	49.52 ± 9.86	52.0 (27 - 64)	t=-0.372 p=0.711
	In Remission	54	50.15 ± 7.74	51.0 (19 - 62)	
Cancer Response Styles Scale Total	Newly Diagnosed	56	115.04 ± 11.13	117.5 (79 - 137)	Z=-6.116 **p=0.000***
	In Remission	54	98.89 ± 14.10	98.0 (54 - 146)	

*t: Independent Sample t-Test, Z: Mann Whitney U Test, *p<0.05*

Table 3 shows that the evaluation of generalized anxiety scale scores of the participants according to the disease stages. According to the results obtained; a statistically significant difference was found between the generalized anxiety scale scores of the participants according to the disease stages (t=4.328; p<0.05). It was determined that the anxiety level of those in the newly diagnosed of the disease were higher than those in the remission of the disease.

Table 3

Generalized Anxiety Scale Scores According to Disease Stages of the Participants

	Disease Stage	N	X ± SS	M (Min - Max)	Statistics
Generalized Anxiety Scale	Newly Diagnosed	56	1591.12 ± 282.62	1588.8 (1020 - 2253)	t=4.328 **p=0.000***
	In Remission	54	1284.44 ± 445.34	1357.5 (358 - 2075)	

*Independent Sample t-Test, *p<0.05*

Table 4 indicates the participant's metacognition scale scores according to their disease stages. According to the results obtained; a statistically significant difference was found between the scores of the need to control thoughts sub-dimension (Z=-5.612; p<0.05) and the cognitive awareness sub-dimension (Z=-4.610; p<0.05). It was determined that the scores of the need to control thoughts and cognitive awareness in the newly diagnosed of the disease were higher than those in the remission of the disease. Moreover, the total metacognitive activity of those in the newly diagnosed of the disease were higher than those in the in-remission group.

Table 4

Metacognition Scale Scores According to the Disease Stages of the Participants

	Disease Stage	N	X ± SS	M (Min - Max)	Statistics
Positive Beliefs	Newly Diagnosed	56	11.43 ± 5.55	10.0 (6 - 24)	Z=0.497 p=0.619
	In Remission	54	10.26 ± 3.59	9.5 (6 - 18)	
The Need to Control Thoughts	Newly Diagnosed	56	18.87 ± 4.49	20.0 (9 - 24)	Z=-5.612 **p=0.000***
	In Remission	54	13.44 ± 4.09	14.0 (6 - 22)	
Cognitive Confidence	Newly Diagnosed	56	11.57 ± 4.94	11.0 (6 - 24)	Z=0.142
	In Remission	54	11.54 ± 4.53	11.0 (6 - 23)	p=0.887
Uncontrollability and Danger	Newly Diagnosed	56	13.59 ± 4.33	12.0 (6 - 24)	Z=0.234
	In Remission	54	13.07 ± 3.93	13.0 (6 - 22)	p=0.815
Cognitive Awareness	Newly Diagnosed	56	19.30 ± 3.94	19.0 (10 - 24)	Z=-4.610 **p=0.000***
	In Remission	54	15.70 ± 3.41	16.0 (6 - 23)	
Metacognition Scale Total	Newly Diagnosed	56	74.77 ± 14.28	73.0 (39 - 104)	t=3.991 **p=0.000***
	In Remission	54	64.02 ± 13.95	64.5 (30 - 91)	

*t: Independent Sample t-Test, Z: Mann Whitney U Test, *p<0.05*

Table 5 is about metacognition scale scores were evaluated according to the age of the participants. According to the results obtained; A statistically significant difference was found between the scores of the Need to Control Thoughts sub-dimension (t=-2.058; p<0.05) and cognitive confidence sub-dimension (Z= -2.140; p<0.05) according to the age of the participants. It was determined that older

participants (45 and more) need to control their thoughts more than younger participants; Their confidence in the cognitive activities is low.

Table 5

Metacognition Scale Scores According to the Age of the Participants

	Age	N	X ± SS	M (Min - Max)	Statistics
Positive Beliefs	Under 45	52	10.13 ± 4,19	9.0 (6 - 24)	Z=-1.318 p=0.187
	45 and above	58	11.50 ± 5.08	10.0 (6 - 24)	
The Need to Control Thoughts	Under 45	52	15.17 ± 4.92	15.0 (6 - 24)	t=-2.058 **p=0.042***
	45 and above	58	17.14 ± 5.07	17.5 (6 - 24)	
Cognitive Confidence	Under 45	52	10.60 ± 4.56	9.5 (6 - 23)	Z=-2.140 **p=0.032***
	45 and above	58	12.41 ± 4.74	12.0 (6 - 24)	
Uncontrollability and Danger	Under 45	52	13.08 ± 3.99	12.0 (6 - 22)	Z=-0.550 p=0.582
	45 and above	58	13.57 ± 4.27	13.0 (6 - 24)	
Cognitive Awareness	Under 45	52	17.33 ± 3.81	17.0 (10 - 24)	t=-0.507 p=0.614
	45 and above	58	17.72 ± 4.36	18.0 (6 - 24)	
Metacognition Scale Total	Under 45	52	66.31 ± 13.33	63.5 (40 - 104)	t=-2.133 **p=0.035***
	45 and above	58	72.34 ± 16.03	72.0 (30 - 103)	

*t: Independent Sample t-Test, Z: Mann Whitney U Test, *p<0.05*

Table 6 is about the scores of the cancer response styles according to the age of the participants. As the results obtained there is a statistically significant difference was found between the scores of the fatalism sub-dimension according to the age of the participants (Z=-2.163; p<0.05). It was determined that younger group were less fatalistic about cancer than in the age group of 45 and over.

Table 6

Cancer Response Style Scale Scores According to the Age of the Participants

	Age	N	X ± SS	M (Min - Max)	Statistics
Desperation/Hopelessness	Under 45	52	9.79 ± 3.90	9.0 (6 - 20)	Z=-1.213 p=0.225
	45 and above	58	11.12 ± 5.17	9.5 (6 - 23)	
Anxious Waiting	Under 45	52	24.50 ± 5.10	24.5 (13 - 35)	Z=-1.557 p=0.120
	45 and above	58	25.90 ± 5.96	27.5 (12 - 35)	
Denial/Avoidance	Under 45	52	2.10 ± 1.18	2.0 (1 - 4)	Z=-1.411 p=0.158
	45 and above	58	2.38 ± 1.14	2.0 (1 - 4)	
Fatalism	Under 45	52	18.23 ± 4.85	17.5 (10 - 28)	Z=-2.163 **p=0.031***
	45 and above	58	20.28 ± 4.76	21.0 (10 - 32)	
Fighting Spirit	Under 45	52	51.04 ± 7.99	51.0 (32 - 64)	Z=-1.091 p=0.275
	45 and above	58	48.74 ± 9.49	49.5 (19 - 64)	
Cancer Response Styles Scale Total	Under 45	52	105.65 ± 13,33	105.0 (77 - 137)	Z=-1.291 p=0.197
	45 and above	58	108.41 ± 16.35	113.5 (54 - 146)	

*Mann Whitney U Test, *p<0.05*

Table 7 indicates the metacognition scale scores according to the education levels of the participants (Table 7). According to the results obtained; a statistically significant difference was found between the scores of the Cognitive Trust sub-dimension according to the education levels of the participants (KW=11.603; p<0.05). Besides according to the Posthoc test results; It was determined that the Cognitive Confidence sub-dimension scores of primary school graduates were higher than those of doctoral graduates. It means that they do not trust their cognitive activity as much as highly educated participants.

Table 7

Metacognition Scale Scores According to the Education Level of the Participants

	Education Level	**N**	**X ± SS**	**M (Min - Max)**	**Statistics**
Positive Beliefs	Primary School (1)	11	9.27 ± 2.94	10.0 (6 - 13)	KW=5.164 p=0.271
	High School (2)	30	10.60 ± 4.64	9.0 (6 - 24)	
	Undergraduate (3)	44	10.64 ± 5.06	9.0 (6 - 24)	
	Graduate (4)	21	11.62 ± 4.12	10.0 (6 - 18)	
	Doctor (5)	4	15.50 ± 6.76	15.0 (8 - 24)	
The Need to Control Thoughts	Primary School (1)	11	18.45 ± 4.68	18.0 (11 - 24)	KW=6.142 p=0.189
	High School (2)	30	16.37 ± 6.23	17.0 (6 - 24)	
	Undergraduate (3)	44	15.11 ± 4.35	15.0 (7 - 24)	
	Graduate (4)	21	16.48 ± 4.87	16.0 (6 - 24)	
	Doctor (5)	4	19.50 ± 2.38	19.5 (17 - 22)	
Cognitive Confidence	Primary School (1)	11	14.18 ± 4.73	13.0 (7 - 24)	KW=11.603 **p=0.021*** 1>5 [a]
	High School (2)	30	12.57 ± 4.52	12.5 (6 - 21)	
	Undergraduate (3)	44	11.09 ± 4.92	10.0 (6 - 23)	
	Graduate (4)	21	10.62 ± 4.13	10.0 (6 - 18)	
	Doctor (5)	4	6.75 ± 1.50	6.0 (6 - 9)	
Uncontrollability and Danger	Primary School (1)	11	14.09 ± 4.21	12.0 (9 - 21)	KW=5.239 p=0.264
	High School (2)	30	14.40 ± 4.64	14.0 (6 - 21)	
	Undergraduate (3)	44	13.16 ± 4.03	12.0 (7 - 24)	
	Graduate (4)	21	12.19 ± 3.59	12.0 (6 - 18)	
	Doctor (5)	4	11.25 ± 2.06	11.5 (9 - 13)	
Cognitive Awareness	Primary School (1)	11	19.36 ± 3.75	19.0 (14 - 24)	KW=5.724 p=0.221
	High School (2)	30	4.77 ± 16.80	16.0 (6 - 24)	
	Undergraduate (3)	44	17.32 ± 3.56	17.0 (10 - 24)	
	Graduate (4)	21	5.52 ± 4.30	17.0 (11 - 24)	
	Doctor (5)	4	20.50 ± 2.65	20.0 (18 - 24)	
Metacognition Scale Total	Primary School (1)	11	75.36 ± 13.06	73.0 (58 - 93)	KW=4.412 p=0.353
	High School (2)	30	70.73 ± 18.09	72.5 (30 - 104)	
	Undergraduate (3)	44	67.32 ± 13.86	63.0 (40 - 103)	
	Graduate (4)	21	68.43 ± 14.08	68.0 (38 - 91)	
	Doctor (5)	4	73.50 ± 13.89	73.0 (59 - 89)	

*Kruskal Wallis H Test, *p<0.05, a: Bonferroni Posthoc Test*

Table 8 shows the scores of the Cancer Response Style Scale according to the education levels of the participants. The results show that there is a statistically significant difference was found between the scores of the Denial/Avoidance (KW=10.206; p<0.05) Fatalism (KW=13.113; p<0.05) and Fighting Spirit (KW=10.865; p<0.05) sub-dimensions according to the education levels of the participants. It was determined that the Fatalism sub-dimension scores of primary school graduates were higher than those of undergraduate and graduate graduates and Fighting Spirit sub-dimension scores of high school graduates were lower than those of undergraduate and doctoral graduates.

Table 8

Cancer Response Style Scale Scores According to the Education Level of the Participants

	Education Level	**N**	**X ± SS**	**M (Min - Max)**	**Statistics**
Desperation/Hopelessness	Primary School (1)	11	13.27 ± 4.58	14.0 (6 - 20)	KW=8.736 p=0.068
	High School (2)	30	11.63 ± 5.32	10.0 (6 - 22)	
	Undergraduate (3)	44	9.43 ± 4.39	8.0 (6 - 23)	
	Graduate (4)	21	9.71 ± 3.81	8.0 (6 - 19)	
	Doctor (5)	4	10.00 ± 1.83	10.0 (8 - 12)	
Anxious Waiting	Primary School (1)	11	27.36 ± 5.16	28.0 (19 - 33)	KW=5.994 p=0.199
	High School (2)	30	25.63 ± 5.95	26.5 (12 - 35)	
	Undergraduate (3)	44	23.86 ± 5.49	23.0 (13 - 33)	
	Graduate (4)	21	25.81 ± 5.23	26.0 (14 - 33)	
	Doctor (5)	4	28.50 ± 5.20	29.0 (22 - 34)	
Denial/Avoidance	Primary School (1)	11	2.82 ± 1.33	3.0 (1 - 4)	KW=10.206 p=0.037*
	High School (2)	30	2.3 ± 1.30	3.0 (1 - 4)	
	Undergraduate (3)	44	1.84 ± 1.01	2.0 (1 - 4)	
	Graduate (4)	21	2.24 ± 1.00	2.0 (1 - 4)	
	Doctor (5)	4	2.25 ± 0.50	2.0 (2 - 3)	
Fatalism	Primary School (1)	11	23.27 ± 1.56	24.0 (20 - 26)	KW=13.113 p=0.011* 1>3, 1>4 [a]
	High School (2)	30	7.20 ± 5.25	20.5 (10 - 26)	
	Undergraduate (3)	44	18.52 ± 5.12	17.0 (10 - 32)	
	Graduate (4)	21	18.38 ± 3.99	19.0 (10 - 25)	
	Doctor (5)	4	22.75 ± 4.79	23.0 (17 - 28)	
Fighting Spirit	Primary School (1)	11	47.91 ± 10.62	48.0 (31 - 63)	KW=10.865 p=0.028* 2<3, 2<5 [a]
	High School (2)	30	45.40 ± 10.08	48.5 (19 - 60)	
	Undergraduate (3)	44	51.93 ± 7.85	53.5 (33 - 64)	
	Graduate (4)	21	51.67 ± 6.13	51.0 (40 - 64)	
	Doctor (5)	4	55.50 ± 3.70	56.0 (51 - 59)	
Cancer Response Styles Scale Total	Primary School (1)	11	114.64 ± 12.48	118.0 (94 - 132)	KW=8.069 p=0.089
	High School (2)	30	104.50 ± 17.33	110.0 (54 - 125)	
	Undergraduate (3)	44	105.59 ± 14.33	103.5 (79 - 146)	
	Graduate (4)	21	107.81 ± 13.78	110.0 (84 - 137)	
	Doctor (5)	4	119.00 ± 6.16	121.0 (110 - 124)	

*Kruskal Wallis H Test, *p<0.05, a: Bonferroni Posthoc Test*

Table 9 is about metacognition scale scores according to the working status of the participants. According to the results obtained.; a statistically significant difference was found between the scores of

the Uncontrollability and Danger sub-dimension according to the working status of the participants (KW=12.046; p<0.05). According to the posthoc test results; It was determined that the uncontrollability and danger sub-dimension scores of the employees were lower than those who did not work. It means that participants who currently working think they have more control over their thoughts and are less likely to believe that they will lead to any danger in cancer processes.

Table 9

Metacognition Scale Scores According to the Working Status of the Participants

	Working Status	**N**	**X ± SS**	**M (Min - Max)**	**Statistics**
Positive Beliefs	Working (1)	60	11.08 ± 5.08	10.0 (6 - 24)	KW=3.922 p=0.141
	Not working (2)	44	10.09 ± 4.02	9.0 (6 - 21)	
	Retired (3)	6	14.17 ± 4.62	15.0 (6 - 18)	
The Need to Control Thoughts	Working (1)	60	15.45 ± 4.99	15.0 (6 - 24)	KW=2.811 p=0.245
	Not working (2)	44	17.11 ± 5.23	17.0 (6 - 24)	
	Retired (3)	6	17.17 ± 4.07	16.5 (13 - 24)	
Cognitive Confidence	Working (1)	60	10.55 ± 4.13	10.0 (6 - 19)	KW=5.976 p=0.050
	Not working (2)	44	12.55 ± 5.16	12.0 (6 - 24)	
	Retired (3)	6	14.33 ± 5.13	15.5 (7 - 21)	
Uncontrollability and Danger	Working (1)	60	12.08 ± 3.86	11.5 (6 - 24)	KW=12.046 p=0.002 * 1<2 [a]
	Not working (2)	44	14.84 ± 4.09	14.0 (9 - 22)	
	Retired (3)	6	14.83 ± 3.19	15.0 (11 - 18)	
Cognitive Awareness	Working (1)	60	16.95 ± 4.43	16.5 (6 - 24)	KW=3.208 p=0.201
	Not working (2)	44	18.18 ± 3.61	18.0 (8 - 24)	
	Retired (3)	6	18.67 ± 3.50	19.0 (14 - 24)	
Metacognition Scale Total	Working (1)	60	66.12 ± 14.38	65.0 (30 - 95)	KW=6.728 p=0.035* 1<3 [a]
	Not working (2)	44	72.77 ± 15.29	72.5 (45 - 104)	
	Retired (3)	6	79.17 ± 12.14	81.5 (61 - 91)	

*Kruskal Wallis H Test, *p<0.05, a: Bonferroni Posthoc Test*

Table 10 indicates the metacognition scale scores according to the participant's sufficient knowledge level about the disease. According to the results obtained; A statistically significant difference was found between the scores of the uncontrollability and danger sub-dimension according to the participants' adequate knowledge about the disease (Z=-2.132; p<0.05). It was determined that the scores of the uncontrollability and danger sub-dimension of those who were adequately informed about the disease were lower than those who were not sufficiently informed about the disease. It means that when people are adequately and accurately informed about the disease, they believe that they can control the thoughts that come, and they find the cognitive activities less dangerous.

Table 10

Metacognition Scale Scores According to the Participant's Sufficient Knowledge About the Disease

	Adequate Information About the Disease	N	X ± SS	M (Min - Max)	Statistics
Positive Beliefs	Yes	103	10.86 ± 4.79	10.0 (6 - 24)	Z=-0.271 p=0.786
	No	7	10.71 ± 3.64	9.0 (6 - 16)	
The Need to Control Thoughts	Yes	103	16.24 ± 5.10	16.0 (6 - 24)	Z=-0.375 p=0.708
	No	7	15.71 ± 5.06	15.0 (8 - 24)	
Cognitive Confidence	Yes	103	11.45 ± 4.64	11.0 (6 - 24)	Z=-0.771 p=0.441
	No	7	13.14 ± 5.98	12.0 (6 - 23)	
Uncontrollability and Danger	Yes	103	13.09 ± 4.00	12.0 (6 - 24)	Z=-2.132 p=0.033*
	No	7	5.00 ± 4.55	18.0 (11 - 22)	
Cognitive Awareness	Yes	103	5.50 ± 4.13	17.0 (6 - 24)	Z=-0.252 p=0.801
	No	7	18.00 ± 3.65	18.0 (13 - 24)	
Metacognition Scale Total	Yes	103	69.15 ± 15.35	68.0 (30 - 104)	Z=-1.078 p=0.281
	No	7	74.57 ± 9.03	75.0 (62 - 85)	

*Mann Whitney U Test, *p<0.05*

Table 11 shows the relationship between the scores of the metacognition scale and the cancer response style scale scores of the participants. According to the results obtained; A high level of positive correlation was found between the scores of the anxious waiting sub-dimension of the cancer response style scale and the need to control thoughts sub-dimension scores of the metacognition scale (r=0.635; p<0.05). Besides a positive weak level correlation was found between the scores of the Helplessness/Hopelessness sub-dimension of the cancer response styles scale and the positive beliefs sub-dimension (r=0.220), the need to control thoughts sub-dimension (r=0.276), the cognitive trust sub-dimension (r=0.293), the uncontrollability and danger sub-dimension (r=0.238) and the total (r=0.322) scores of the metacognition scale (p<0.05).

A moderate positive correlation was found between the scores of the anxious waiting sub-dimension of the cancer response styles scale and the cognitive awareness sub-dimension of the metacognition scale (r=0.575) and the total (r=0.540) scores of the metacognition scale (p<0.05). A positive weak level correlation was found between the scores of the anxious waiting sub-dimension of the cancer response styles scale and the positive beliefs sub-dimension (r=0.211) and uncontrollability and danger sub-dimension (r=0.247) scores of the metacognition scale (p<0.05).

A moderate positive correlation was found between the scores of the denial/avoidance sub-dimension of the cancer response styles scale and the thoughts control need sub-dimension of the metacognition scale (r=0.527) and the total (r=0.407) scores of the metacognition scale (p<0.05). A positive weak level correlation was found between the scores of the denial/avoidance sub-dimension of the cancer response styles scale and the uncontrollability and danger sub-dimension (r=0.239) and cognitive awareness sub-dimension (r=0.240) scores of the metacognition scale (p<0.05).

A moderate positive correlation was found between the scores of the fatalism sub-dimension of the cancer response style scale and the need to control thoughts sub-dimension of the metacognition scale (r=0.552) and the total (r=0.462) scores of the metacognition scale (p<0.05). A positive weak level correlation was found between the scores of the fatalism sub-dimension of the cancer response styles

scale and the cognitive trust sub-dimension (r=0.200), uncontrollability and danger sub-dimension (r=0.233) and cognitive awareness sub-dimension (r=0.349) scores of the metacognition Scale (p<0.05).

A moderate positive correlation was found between the scores of the fighting spirit sub-dimension of the cancer response style scale and the cognitive awareness sub-dimension scores of the metacognition scale (r=0.431; p<0.05). A negative weak level correlation was found between the scores of the fighting spirit sub-dimension of the cancer response styles scale and the cognitive trust sub-dimension scores of the metacognition scale (r=-0.320; p<0.05).

A high level of positive correlation was found between the total scores of the cancer response style scale and the need for control of thoughts sub-dimension (r=0.656) and cognitive awareness sub-dimension (r=0.656) scores of the metacognition scale (p<0.05). A moderate positive correlation was found between the total scores of the cancer response style scale and the total scores of the metacognition scale (r=0.563; p<0.05). A positive weak level correlation was found between the total scores of the cancer response styles scale and the uncontrollability and danger sub-dimension scores of the metacognition Scale (r=0.271; p<0.05).

Table 11

The Relationship Between the Scores of the Metacognition Scale and the Cancer Response Style Scale Scores of the Participants

	Cancer Response Styles Scale											
	Desperation/ Despair		**Anxious Wait**		**Deny/ Avoid**		**Fatalism**		**Combative Soul**		**Cancer Response Styles Scale Sum**	
Metacognition Scale	**r**	**p**	**r**	**p**	**r**	**p**	**r**	**p**	**r**	**p**	**r**	**p**
Positive Beliefs	0.220	**0.021***	0.211	**0.027***	0.106	0.272	0.118	0.221	-0.039	0.683	0.179	0.061
Thoughts The Need for Control	0.276	**0.004***	0.635	**0.000***	0.527	**0.000***	0.552	**0.000***	0.117	0.225	0.656	**0.000***
Cognitive Confidence	0.293	**0.002***	0.026	0.784	0.180	0.059	0.200	**0.036***	-0.320	**0.001***	0.030	0.758
Uncontrollability and Danger	0.238	**0.012***	0.247	**0.009***	0.239	**0.012***	0.233	**0.014***	-0.063	0.516	0.271	**0.004***
Cognitive Awareness	0.045	0.638	0.575	**0.000***	0.240	**0.012***	0.349	**0.000***	0.431	**0.000***	0.656	**0.000***
Metacognition Scale Sum	0.322	**0.001***	0.540	**0.000***	0.407	**0.000***	0.462	**0.000***	0.045	0.640	0.563	**0.000***

*Spearman's Correlation, *p<0.05*

Table 12 shows the relationship between the scores of the generalized anxiety scale and the scores of the metacognition scale and the cancer response style scale. According to the results obtained; A moderate positive correlation was found between the scores of the generalized anxiety scale and the need to control thoughts sub-dimension (r=0.471) and cognitive awareness sub-dimension (r=0.450) scores (p<0.05). A positive weak level correlation was found between the scores of the generalized anxiety scale and the positive beliefs sub-dimension (r=0.218) and the total (r=0.375) scores of the metacognition Scale (p<0.05).

A moderate positive correlation was found between the scores of the generalized anxiety scale and the anxious waiting sub-dimension (r=0.478) and the total (r=0.480) scores of the cancer response style scale (p<0.05). A positive weak level correlation was found between the generalized anxiety scale scores of the participants and the helplessness/hopelessness sub-dimension (r=0.218), denial/avoidance (r=0.332) and fatalism sub-dimension (r=0.393) scores (p<0.05).

Table 12

The Relationship Between the Participant's Generalized Anxiety Scores and the Scores of the Metacognition Scale and the Cancer Response Style Scale

	Generalized Anxiety Scale	
	r	**p**
Metacognition Scale		
Positive Beliefs	0.218	**0.022***
The Need to Control Thoughts	0.471	**0.000***
Cognitive Confidence	0.003	0.978
Uncontrollability and Danger	0.163	0.088
Cognitive Awareness	0.450	**0.000***
Metacognition Scale Total	0.375	**0.000***
Cancer Response Styles Scale		
Desperation/Hopelessness	0.218	**0.022***
Anxious Waiting	0.478	**0.000***
Denial/Avoidance	0.332	**0.000***
Fatalism	0.393	**0.000***
Fighting Spirit	0.128	0.182
Cancer Response Styles Scale Total	0.480	**0.000***

*Spearman's Correlation, *p<0.05*

4. Discussion

In line with the results obtained, significant relationships were found between cancer response styles and metacognitive beliefs, and it was determined that two independent variables could directly and indirectly affect the level of anxiety in women with breast cancer. Past research and results conducted in line with these themes have emphasized similar relationships (Dönmez, 2016; Karakaş 2020, Ağaç & Özçetin, 2021). This meaningful general result revealed in the research once again revealed the necessity of deepening the relationship between reactions and psychological difficulties based on metacognitive beliefs in chronic diseases.

Throughout the study, the stage of the disease is the most important variable, which creates a clear distinction. The period of breast cancer affected the intensity of metacognitive activity, the way they responded to cancer, and the level of anxiety in participants. In the study, participants in the early stage of the disease scored higher on all scales than those in remission. Accordingly; In women diagnosed with early-stage breast cancer and actively treated, metacognitive beliefs are markedly more intense, they are more likely to cope with cancer in dysfunctional ways, and the anxiety experienced is more severe than in those in remission. These results once again revealed the existence of mental and emotional negative changes experienced with the diagnosis of breast cancer and supported other studies in this field (Mutlu et al., 2018; Cheli et al., 2019; Thewes et al., 2013). In women who survived breast cancer, fear and anxiety of recurrence due to incomplete medical controls, metacognitive beliefs about the

disease, and avoidant or obsessive behaviors were observed. Fear of recurrence is the most frequently described psychological strain in people in remission, regardless of the type of cancer (Geyikçeli, 2023; van de Wal et al., 2016; Simard et al., 2013). Psychoeducation and psychological help given from the onset of cancer is very important in the light of this result. Open communication and easy access to accurate information can reduce anxiety and depression by avoiding possible question marks that may arise in later stages and remission (Mills & Sullivan, 1999; Erdem, 2019; Sinding et al., 2010; Spring, 2007).

In terms of socioeconomic aspects, all the data obtained mostly coincided with the literature. As stated in previous studies, various socioeconomic factors (individual variables such as age, education level, whether working or not, and having sufficient knowledge about the disease, etc.) made a difference in patients' metacognitive activities and response styles to cancer, and therefore in their anxiety levels (Tünel et al., 2012, p. 189; Epping-Jordan et al., 1999; Baider et al., 2003). It is clearly among the findings that the stage of life in which women are located affects the way they respond to cancer (Mor et al., 1994; Tünel et al., 2012). In line with the results obtained, higher cognitive activity intensity was higher in older women than in younger women; It has been observed that the way they respond to the disease is more fatalistic. Similarly, people with low levels of education expressed less confidence in their cognition and mental functions than people with relatively high levels of education. These people have been found to be more inclined to face the disease through dysfunctional means such as denial/avoidance and fatalism. It was observed that in women who thought that they did not have enough information about their disease and did not work, their inactivity increased, and there was an increase in beliefs about the dangerousness and uncontrollability of incoming thoughts. In this respect, the importance of clear, accurate and scientific information for the patient during the treatment has once again been revealed. On the other hand, no direct relationship was found between these results and the anxiety levels of the individuals. However, it is possible to say that anxiety levels may be higher indirectly in women who are "older, have a low level of education, do not actively participate in working life and think that they do not have enough information about their disease" because their reaction styles to the disease are largely emotion-oriented and their metacognitive activities are high. Furthermore, people with these traits may be more vulnerable to experiencing depressive symptoms (Ghanem et al., 2020; Alacalıoğlu, 2007; Reuter et al., 2006; Alcalar et al., 2012). It is frequently emphasized in the literature that situations such as thinking that they have sufficient knowledge about the disease during the illness, having a high level of education and working as much as the physical conditions allow are negatively related to mental health problems. As can be seen, the results of the research on these variables also support the research findings (Çam et al., 2009, p. 73; Campbell-Enns & Woodgate, 2015; Chang et al., 2014). Considering the past literature and the data of the study, detailed observations and evaluations are needed to interpret some meaningful but implicit relationships revealed in the research.

Some findings regarding the age variable obtained from the study contradict the literature. Past research has identified young age as an important risk factor for psychosocial problems in breast cancer (Epping-Jordan et al., 1999; Baider et al., 2003; Mosher & Danoff-Burg, 2005; Sertöz et al., 2004). According to this information, young women express psychological symptoms more frequently than older women in daily life and clinical settings (Campbell-Enns and Woodgate, 2015). The stage of the disease is considered as a possible cause of contrast. The fact that women who receive active treatment for breast cancer (metacognitive activities, anxiety levels are higher than in the remission group; their coping is emotion-oriented) are older than those in remission may be a reason for this contrast. Although a more detailed examination and more research are needed to understand the reasons for the different results found, this result suggests that women with breast cancer, regardless of their stage of life, are at risk of experiencing mental health problems.

As mentioned, in the study, it was observed that sociodemographic variables and the current stage of the disease mostly affected cancer response styles and metacognitive activity. However, cancer response styles and metacognitive beliefs also affect each other bidirectionally. In cases where anxious anticipation of the disease increased, thoughts about uncontrollability and dangerousness, positive metacognitive beliefs, and the need to control metacognitions also increased. Positive metacognitive beliefs, the need to control thoughts, metacognitive beliefs that thoughts are uncontrollable and dangerous are more common in women who meet the disease helpless/hopeless; It has been noticed that trust in cognitions is weaker in this group. A helpless/hopeless attitude increased total metacognitive activity (wandering into thoughts). Similarly, as the use of the denial/avoidance style increased, cognitive awareness increased; Uncontrollability and dangerousness have stimulated metacognition. When the fatalistic approach prevailed, confidence in cognitions weakened; Cognitive awareness of uncontrollability and dangerousness and metacognitive activity increased. In general, it has been observed that pathological metacognitive activity increases as the strength and frequency of use of all other response styles increases, except for the warrior spirit. All these findings showed that high and moderate correlations, metacognitive activity and cancer response styles were significantly related to each other and proceeded in parallel with each other and achieved the purpose of the research. Since women with action-oriented approaches who actively cope with the disease are more likely to experience less psychological distress during the illness, it is among the sine qua non for psychologists working in the field to focus on mental functions, beliefs and their effects on current reactions, as well as identifying and reframing unhelpful coping strategies in psychological interventions applied to this patient group (Elzami et al., 2015, p. 94).

To summarize, there are studies in the literature showing that the use of response styles such as anxious waiting, fatalism, denial avoidance (other styles other than the combative spirit) and the likelihood of experiencing psychological difficulties and various mental health problems inevitably increase in cases where pathological metacognitive activity increases (Ağca, 2021; Güleç & Büyükkınacı, 2011, p. 349; Knowles et al., 2011; Geyikçi et al., 2018, p. 246). The results obtained in line with the research have largely supported this view. Perceptions, interpretations, and beliefs about cancer have influenced coping styles, mental and physical responses to cancer, and mood and anxiety at the end of the day. In the study, three main themes (cancer response styles, metacognitive activity, and anxiety level) were intertwined in sometimes explicit and sometimes implicit, indirect ways; they are related to each other in meaningful ways and at different levels. Regardless of the stage of the disease, how women perceive the disease has sometimes directly and indirectly determined their cognitive functioning, the way they meet and deal with cancer. Cyclical and dysfunctional cognitive and action-oriented activities such as fear of relapse, constant control of body image and physical changes, rumination, which arise and exacerbate in line with people's positive and negative metacognitive beliefs, can cause mental health problems such as anxiety, depression, and obsessive-compulsive disorder to emerge and/or become entrenched (Beck et al., 2023; Soo & Sherman, 2015). In this context, women; In addition to physical pain and symptoms that develop due to the disease and treatment, which can be exacerbated from time to time, even if the disease process ends, it may face social, economic and psychological problems. They may not be able to end the disease on the mental and emotional plane. The importance of psychological and relational support in the breast cancer process emerges once again at this stage. The adoption of a personalized and multidisciplinary treatment approach in psychological evaluations is very meaningful in this patient group. It is thought that people who have been diagnosed at an early stage of breast cancer and have recovered from breast cancer reveal metacognitive beliefs about the disease, and not ignoring these beliefs during interventions can prevent mental health problems that arise during the process before they become chronic and can be effective in eliminating them significantly.

5. Conclusion

To sum up, regardless of the period of the disease, the level of anxiety, metacognitive beliefs and response styles to cancer in women varied in relation to age, education level, working situation and the level of information about the disease. Cancer response styles, metacognitive beliefs and anxiety levels in women in two different periods of the disease vary in relation to socio-demographic data. Besides in newly diagnosed women with early-stage (I, II) breast cancer, the intensity of metacognitive activity, the strength of the use of cancer response styles, the presence of positive/negative metacognitive beliefs about general anxiety levels and anxious thoughts, and the use of dysfunctional coping styles (rumination, avoidance) were higher than those who went through the remission of the disease. Moreover, there is a significant relationship between cancer response styles and metacognitive beliefs. In both periods of the disease; high, moderate, weak, negative and positive relationships were found between cancer response styles and metacognitive beliefs. Besides there is a significant difference between anxiety levels, cancer response styles, and metacognitive beliefs. In both periods of the disease, moderate and weak, negative and positive relationships were found between cancer response styles, metacognitive beliefs and anxiety levels.

In line with the results, patients should be aware of what is going through their minds individually, how they respond to cancer, and whether these are beneficial for them in the process, in order to reduce or prevent the anxiety that arises during the process. Institutions and individuals (psychologists, psychiatrists, oncologists, nurses) should closely monitor the metacognitive beliefs and cancer response styles observed in this group of patients for early awareness and correct intervention. At the same time, the entire treatment team should be competent in providing clear, clear and accurate information to patients. Factors such as the age, socioeconomic level, culture and stage of the disease should be considered by the relatives and the treatment team. Patients should be closely monitored biologically, psychologically and socially, especially during the newly diagnosed period of cancer and during active treatment. Concerns and fears about metastasis or recurrence during the post-cancer remission period should be examined separately. To understand the needs of the patients correctly, people should be handled biopsychosocially throughout the process.

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