RESEARCH

Unexpected Features of Coronavirus Anxiety: Examination of Factors Predicting COVID-19 Pandemic-Related Anxiety among Cancer Patients

Koronavirüs Kaygısının Beklenmeyen Yönleri: Kanser Hastalarının COVID-19 Kaygılarını Etkileyen Faktörlerin İncelenmesi

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Abstract

While influencing the whole world, the 2019 coronavirus disease has also created a psychological burden on cancer patients, who are considered to be at increased risk. Although psychological factors predicting cancer patients' mental health have been revealed in a large body of literature, the role of these factors under the exceptional circumstances of a global pandemic need to be explored. Therefore, it was aimed to investigate the relationships between emotional control, coping styles, and perceived personal threat of contracting COVID-19 and the pandemic-related anxiety of cancer patients. Data were collected from 80 participants living in Turkey who have been diagnosed with cancer. Hierarchical regression analysis revealed that pandemic-related anxiety was predicted by lower control of depressive emotions, increased use of seeking social support as a coping style, and higher perceived personal threat of contracting COVID-19, whereas pandemic-related anxiety seemed to be higher among non-metastatic cancer patients. Outcomes that diverge from the pre-pandemic literature have underlined the significance of considering the varying demands of pandemic conditions and reorganizing psychological interventions accordingly for cancer patients.

Keywords: Anxiety, cancer, COVID-19, emotions

Öz

Koronavirüs pek çok kişiyi etkilediği gibi risk grubunda olarak görülen kanser hastaları için de psikolojik bir yük yaratmıştır. Her ne kadar kanser hastalarının psikolojik sağlığını etkileyen psikolojik faktörler geniş bir literatürde ortaya konmuş olsa da, bu faktörlerin küresel bir pandeminin istisnai koşulları altındaki rolünün araştırılması önemli görülmektedir. Bu nedenle, bu çalışmada duygusal kontrol, başa çıkma stilleri ve algılanan kişisel COVID-19 bulaşma tehdidi ile kanser hastalarının pandemi ile ilişkili kaygıları arasındaki ilişkilerin araştırılması amaçlanmıştır. Bu kapsamda, Türkiye'de yaşayan ve kanser tanısı almış 80 katılımcıdan veri toplanmıştır. Hiyerarşik regresyon analizi, pandemi ile ilgili kaygının, depresif duyguların daha düşük kontrolü, başa çıkma tarzı olarak sosyal destek aramanın daha fazla kullanılması ve algılanan COVID-19 bulaşma tehditinin yüksek olması tarafından yordandığını göstermektedir. Ayrıca, metastazı olmayan kanser hastalarının covid-19 pandemisiyle ilgili kaygılarının daha yüksek olduğu görülmüştür. Pandemi öncesi alanyazından ayrılan sonuçlar olması, pandemi koşullarının değişen taleplerini dikkate almanın ve kanser hastaları için psikolojik müdahaleleri bu çerçevede yeniden düzenlemenin gereğini vurgulaması açısından önemlidir.

Anahtar sözcükler: Kaygı, kanser, COVID-19, duygular

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CORONAVIRUS DISEASE 2019 (COVID-19) is a pandemic that started to appear in China in December 2019 (Lu et al. 2020) and has spread rapidly worldwide. This pandemic has affected people in many different aspects of life, such as physically (different kinds of health problems), socially (social isolation), and psychologically (anxiety, fear, etc.). Many people feel more anxious due to the uncertainty of the pandemic's duration and course (Özdin and Bayrak-Özdin 2020), struggling with changes, accepting the restrictions imposed on daily life, or taking the necessary precautions. Furthermore, changes and uncertainties in business and financial situations can cause psychological distress in the society in general (Chew et al. 2020). As a result, there has been an increase in anxiety, depression, sleep disturbances, and stress-related issues (Torales et al. 2020). According to a study conducted in China at the beginning of the pandemic to reveal its first effects, more than half of the participants were found to have moderate to severe psychological problems (Wang et al. 2020). Although there seems to be a general increase in psychological problems during this period, some individuals have been affected more negatively than others. People who have chronic illnesses such as diabetes, asthma, hypertension, and cancer may have higher health-related risks if they are infected with the COVID-19 virus (Onder et al. 2020). One study found that during the COVID-19 pandemic, children with a chronic condition and their families have been more anxious than a healthy control group (Ademhan Tural et al. 2020). Cancer patients in particular are in this risk group because their immune systems may be suppressed due to the treatments they receive, and the cancer can follow a more negative course when these individuals are infected with the COVID-19 virus (Gosain et al. 2020, Kuderer et al. 2020). Most cancer patients experience anxiety as a result of this increased risk during the COVID-19 pandemic (Qian et al. 2020). For this reason, this study aims to examine the anxiety associated with the COVID-19 pandemic experienced by cancer patients.

Psychological reactions to stressful situations, such as pandemics and natural disasters, could be affected by the person's coping styles (Santarnecchi et al. 2018). Behavioral or cognitive efforts to deal with stressful situations are called coping mechanisms. People's reactions to and feelings as well as thoughts about a problem are affected by how they perceive the problem and by their coping styles (Lazarus and Folkman 1984, Lazarus 1999). Thus, people's coping styles can affect the psychological response they give to a stressful situation. These coping strategies fall into two main categories of problem-focused and emotion-focused strategies. A problem-focused coping style includes efforts to change the situation that creates stress. However, emotion-focused coping involves making an effort to change the emotion felt by the person, not the problem itself. People often tend to use emotion-oriented coping styles when they feel that they cannot change the situation at hand (Lazarus and Folkman 1984). Although both are functional styles depending on the type of the problem, higher usage of problem-focused coping styles was associated with lower levels of anxiety (Whatley et ak. 1998). According to a study evaluating the ways of coping with the stress of the COVID-19 pandemic, it was found that 70% of the participants used active coping techniques (Fu et al. 2020). According to another study conducted during the COVID-19 pandemic, positive reframing, acceptance, and the use of humor were all found to be coping methods associated with better mental health (Gurvich et al. 2021). However, these studies were conducted with the general population and there were no

studies done with cancer patients, who have different experiences in comparison to the general population.

Apart from coping styles, the level of emotional control may also affect cancer patients' anxiety levels during the pandemic. The control of emotions can be defined as a person's efforts to keep emotions such as anger, anxiety, and sadness under control. Suppressing or not expressing negative emotions, however, creates a stressor effect (Pennebaker 1997) and is associated with physical health problems (Tacón et al. 2001), can negatively affect a person's social life (Gross and John 2003) and has the possibility of causing psychological problems (Iwamitsu et al. 2005). Since not expressing an emotion does not diminish its effect and may even cause adverse effects, this is seen as an unsuccessful coping mechanism (Campbell-Sills et al. 2006). As shown in the literature, emotion control has a negative effect on the reactions of cancer patients to their diagnoses (Watson and Greer 1983). However, there are different findings in the literature regarding the effects of emotional control on psychological health during the COVID-19 pandemic. In a study conducted with healthcare professionals during the COVID-19 pandemic, emotion control was not found to be associated with post-traumatic stress disorder symptoms and COVID-anxiety (Bidzan et al. 2020). On the other hand, other studies conducted during the COVID-19 pandemic showed that the stress level of an individual increases when emotional control is high (Gallagher et al. 2021, Pérez et al. 2021). Unfortunately, there are no studies focusing on emotion control with cancer patients during the COVID-19 pandemic. Furthermore, it is known that coping behaviors can change according to the perceived threat in stressful situations. According to a study, perceived threat was found to be the strongest predictor of emotional response and coping behaviors during the COVID-19 pandemic (Cypryańska and Nezlek 2020).

As the COVID-19 virus has caused a pandemic that has affected the whole world for an uncertain period of time, most people's anxiety levels have increased. However, cancer patients' anxiety regarding this pandemic has not been studied. Since cancer patients are actively struggling with a chronic disease, it is thought that they may react differently to stress than the average population during the period of the pandemic. For these reasons, this study has aimed to investigate the effect of individual factors such as coping styles, emotion control, and perception of the pandemic on the anxiety of cancer patients concerning the COVID-19 pandemic.

Method

Sample

The sample of the present study consists of 80 participants living in Turkey who were diagnosed with cancer. Among these participants, 59 (73.75%) were female and 21 (26.25%) were male. Their ages ranged from 19 to 70 (M = 43.14, SD = 12.03). The majority of the participants (78.8%) were still continuing their cancer treatment. 16.3% of the participants were first stage, 16.3% were second stage, 20% were third stage, and 25% were fourth stage cancer patients and remaining 22.5% of them stated that they did not have this information. Participants with metastasis were 42.5% of the sample and remaining 57.5% of them were cancer patients without metastases. Detailed information on demographic characteristics and medical conditions of the participants is presented in Table 1.

At the beginning of the study, the sample size was planned with power analysis by the G*Power software 3.1 for the linear multiple regression R2 increase. The software recommended 86 participants (.80 power, .15 effect size at the standard .05 alpha error probability). Considering the possible data loss, the data collection process was stopped when the number of participants reached 117. Although 117 people participated in the study, the data of the 37 participants who did not fully respond to all scales were excluded. So, the number of people who completed all the scales was 80. Because reaching cancer patients during the pandemic was difficult, due to factors related to accessibility and motivation, no attempt was made to reach additional participants. Thus, these 80 participants formed the final sample of the study.

Table 1. Demographic and medical characteristics of the sample

		n	%
Level of education	High school graduate and lower	33	41.3
	Undergraduate and higher	47	58.8
Marital status	Single	16	20.0
	Romantically involved	1	1.3
	Married	54	67.5
	Divorced	9	11.3
Cancer treatment	Ongoing treatment	63	78.8
	Discontinued treatment	17	21.3
Stage of cancer	1	13	16.3
	2	13	16.3
	3	16	20.0
	4	20	25.0
	Does not have the information	18	22.5
Metastasis	Patients with metastasis	34	42.5
	Patients without metastases	46	57.5

Procedure

In Turkey, the first case of COVID-19 was announced in March 2020. The data for this study were collected from June to October 2020, a period in which the cumulative effects of the pandemic were beginning to be observed. In line with the purpose of the study, the development of a set of questions for measuring the experiences of cancer patients specific to the newly- emerged pandemic circumstances was initiated. Upon completing the development of these new scales to measure pandemic-related anxiety among cancer patients and perceived personal threat of contracting COVID-19, ethical approval was obtained from Başkent University Ethics Committee (Approval Number: 17162298.600-419, Approval Date: 2 June 2020). The participants were reached by announcing the study through social media groups in which cancer patients were included due to social distancing and other restrictions of the pandemic. Participation was on a voluntary basis and participants were not paid for their participation. The data of the current study were collected online by using Qualtrics software (Qualtrics, Provo, UT). All participants received informed consent forms at the beginning of the online surveys. The software program was instructed to present the scales randomly to the participants. Any question was not allowed to be left blank. It took approximately 30 minutes for the participants to complete the 73-question survey. Security survey options of the Qualtrics software prevented multiple submissions of the same participants

through placing a cookie on the browser which could be recognised in case of attempting to access the survey again.

Measures

Demographic and medical information form

This form was generated by the authors to obtain demographic and cancer-related medical infiormation of the participants. Demographic part of the form consisted of five questions about age, gender, level of education, relationship status, and whether to have children. Medical information part of the form included four questions about whether cancer treatment continued, whether there was metastasis, the stage of cancer and whether or not psychological treatment was received.

Courtauld Emotional Control Scale

Watson and Greer (1983) developed the original form of this scale to assess individuals' levels of control of their emotional reactions in certain situations. This four-point Likert-type scale includes 21 items and has a three-factor structure (control of anger, anxiety, and depression) with seven items for each factor. Higher scores indicate higher levels of emotional control and refraining from expressing those emotions. The Turkish adaptation study of this scale was conducted by Okyayuz (1993). The results of this adaptation study indicated that while the internal consistency coefficient of the total scale was .87, the anger (Cronbach's alpha = .80), anxiety (Cronbach's alpha = .78), and depression (Cronbach's alpha = .77) sub-scales also had satisfactory levels of internal consistency. In the current study, Cronbach's alpha coefficient of the total scale was found to be .89. The Cronbach's alpha coefficints of the anger, anxiety, and depression sub-scales were .81, .78, and .75 respectively.

Coping Style Scale

This scale was initially developed by Folkman and Lazarus (1980) as the Ways of Coping Inventory, a four-point Likert-type scale with 66 items. With reference to the Ways of Coping Scale, Şahin and Durak (1995) designed a shorter measure, namely the Coping Style Scale, to assess depression, anxiety, loneliness, and other symptoms of psychological stress. This 30-item, four-point Likert-type scale has a five-factor structure including self-confident, optimistic, submissive, and helpless styles as well as seeking social support. These factors reflect two dimensions of the scale: effective style/problem-oriented and ineffective style/emotion-oriented. Cronbach's alpha coefficients of each sub-scale in different stages of the analyses varied between .49 and .68 for the optimistic style, between .62 and .80 for the self-confident style, between .64 and .73 for the helpless style, between .47 and .72 for the submissive style, and between .45 and .47 for seeking social support. Considering the correlations with other relevant measures, the Coping Style Scale is a reliable and valid measure of stress-related coping styles (Şahin and Durak 1995). In the present study, the Cronbach's alpha coefficient was found to be .85 for the self-confident style, .77 for the helpless style, .51 for the submissive style, .80 for the optimistic style, and .61 for seeking social support.

Pandemic-Related Anxiety for Cancer Patients Scale

At the beginning of the study, the authors created a set of questions in order to assess

the level of pandemic-related anxiety experienced by cancer patients. What was intended to be understood by the pandemic-related anxiety was the anxiety experienced in terms of the extent of the pandemic's effects on the lives of cancer patients. With this in mind, participants were asked to rate their anxiety levels of the week before on a five-point Likert-type scale for the following eight circumstances: being in a hospital, having side effects of chemotherapy, having/probability of having a weakened immune system, trying to follow social distancing guidelines at home, trying to follow social distancing guidelines outside the home, being part of a risk group, following the news, and coming across COVID-19-related content on social media. These conditions were determined by the authors, one of whom was a clinical psychologist who worked with cancer patients for three years in the oncology department of a hospital, considering the daily requirements of cancer patients and their presence in the risk group. Higher scores indicated higher levels of pandemic-related anxiety. The internal consistency coefficient of the total scale was found to be .84.

Table 2. Pandemic-Related Anxiety for Cancer Patients Scale

Item 1: Being in a hospital
Item 2: Having side effects of chemotherapy
Item 3: Having/probability of having a weakened immune system
Item 4: Trying to follow social distancing guidelines at home
Item 5: Trying to follow social distancing guidelines outside home
Item 6: Being in a risk group
Item 7: Following the news
Item 8: Coming across COVID-19-related content on social media
Cronbach's alpha = .84

Table 3. Inter-item correlation for Pandemic-Related Anxiety for Cancer Patients Scale

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8
Item 1	1.00	.66	.45	.31	.35	.46	.27	.29
Item 2		1.00	.69	.21	.28	.61	.16	.23
Item 3			1.00	.21	.13	.60	.23	.20
Item 4				1.00	.56	.40	.53	.30
Item 5					1.00	.51	.50	.40
Item 6						1.00	.55	.41
Item 7							1.00	.68
Item 8								1.00

Table 4. Item-total statistics for Pandemic-Related Anxiety for Cancer Patients Scale

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Item 1	26.78	41.59	.57	.49	.82
Item 2	26.84	41.86	.57	.68	.82
Item 3	26.63	43.45	.50	.56	.82
Item 4	27.28	42.48	.51	.43	.83
Item 5	26.36	44.16	.56	.49	.82
Item 6	26.15	42.26	.75	.65	.80
Item 7	26.89	40.38	.60	.65	.81
Item 8	27.03	42.30	.51	.50	.82

KMO= .75

Factor structure of this scale suggested two factors, one being the anxiety based on pandemic conditions (item 7, 5, 8, and 4) and the other being the anxiety based on being a cancer patient during the pandemic (item 2, 3, 1, and 6) (see Tabe 2, 3, 4, and 5 for item reliability and factor analysis). Consequently, this scale was determined to be suitable for use in further analysis. The analyses proceeded by using only the total score of the scale.

Table 5. Factor analysis for Pandemic-Related Anxiety for Cancer Patients Scale

	Loading Onto Factor One	Loading Onto Factor Two
Following the news	.87	
Trying to follow social distancing guidelines outside home	.76	
Coming across COVID-19-related content on social media	.74	
Trying to follow social distancing guidelines at home	.72	
Having side effects of chemotherapy		.92
Having/probability of having a weakened immune system		.85
Being in a hospital		.73
Being in a risk group	.53	.66
Eigenvalue	3.83	1.55
% of Total Variance	47.81	19.41

Perceived Personal Threat of Contracting COVID-19 Scale

Prior to the study, the authors formed a set of questions to assess the degree of personal threat perceived by individuals regarding the COVID-19 pandemic. With this set of questions, participants were asked to score their answers to the following five questions on a five-point Likert-type scale: 1) How high do you think your risk of catching the COVID-19 virus is? 2) In the event of being infected with the COVID-19 virus, how much risk do you think there will be in the treatment process? 3) How worried are you about the possibility of the COVID-19 virus infecting you? 4) To what extent do you think you have taken the necessary measures to reduce the risk of infection from the COVID-19 virus? 5) How competent do you feel in terms of coping with the process of the COVID-19 pandemic?

Table 6. Perceived Personal Threat of Contracting COVID-19 Scale

Item 1: How high do you think your risk of catching the COVID-19 virus is?
Item 2: In the event of being infected with the COVID-19 virus, how much risk do you think there will be in the treatment process?
Item 3: How worried are you about the possibility of the COVID-19 virus infecting you?
Item 4: To what extent do you think you have taken the necessary measures to reduce the risk of infection for the COVID-19 virus?
Item 5: How competent do you feel in terms of coping with the process of the COVID-19 pandemic?
Cronbach's alpha = .63

As it has been aforementioned, these questions were determined by the authors, one of whom was a clinical psychologist who worked with cancer patients for three years in the oncology department of an hospital, considering the treatment process of cancer patients and their vulnerability as being in the risk group. The last two questions were reverse items, and higher total scores indicated higher levels of perceived personal threat. The internal consistency coefficient of the total scale was found to be .63. Considering the effect of a small number of items on internal consistency, this coefficient was taken as an acceptable level. Factor structure of this scale suggested two factors, one being the

perceived threat based on being a cancer patient (item 3, 1, and 2) and the other being the perceived threat based on the level of coping skills (item 5 and 4) (see Table 2, 3, 4 and 5 for item reliability and factor analysis). Consequently, this scale was determined to be suitable for use in further analysis. The analyses proceeded by using only the total score of the scale.

Table 7. Inter-item correlation for Perceived Personal Threat of Contracting COVID-19 Scale

	Item 1	Item 2	Item 3	Item 4	Item 5
Item 1	1.00	.44	.55	.15	.03
Item 2		1.00	.38	.33	.15
Item 3			1.00	.23	-.04
Item 4				1.00	.32
Item 5					1.00

Table 8. Item-total statistics for Perceived Personal Threat of Contracting COVID-19 Scale

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Item 1	15.85	8.89	.48	.37	.52
Item 2	14.96	9.81	.52	.28	.52
Item 3	15.76	8.72	.45	.36	.54
Item 4	15.05	10.73	.37	.21	.58
Item 5	15.58	11.99	.14	.13	.68

KMO= .64

Table 9. Factor analysis for Perceived Personal Threat of Contracting COVID-19 Scale

	Loading Onto Factor One	Loading Onto Factor Two
How worried are you about the possibility of the COVID-19 virus infecting you?	.84	
How high do you think your risk of catching the COVID-19 virus is?	.84	
In the event of being infected with the COVID-19 virus, how much risk do you think there will be in the treatment process?	.68	-.36
How competent do you feel in terms of coping with the process of the COVID-19 pandemic?		.84
To what extent do you think you have taken the necessary measures to reduce the risk of infection for the COVID-19 virus?		.75
Eigenvalue	2.11	1.23
% of Total Variance	42.10	24.66

Statistical analysis

IBM SPSS 21 for Windows was used in the statistical analysis of the data. Initially, Pearson's correlation coefficients of the variables in this study were calculated to examine associations between the variables. The variables included in this analysis were age, gender, level of education, whether to have children, whether there was metastasis, whether or not psychological treatment was received, total score and three subscales of the Courtauld Emotional Control Scale, five subscales of the Coping Style Scale, total score of perceived personal threat of contracting COVID-19 and total score of pandemic-related anxiety for cancer patients. Afterwards, a hierarchical regression analysis was conducted to investigate predictive psychological factors of pandemic-related anxiety for cancer patients. In the first step, age, gender, level of education, and

whether to have children were entered into the equation as demographic variables. The variables of the second step were anger, anxiety and depression as the three sub-scales of the Courtauld Emotional Control Scale since emotional control was an important factor related to psychological difficulties experienced by the cancer patients. The third step's variables were optimistic style, self-confident style, helpless style, submissive style, and seeking social support as the five sub-scales of the Coping Style Scale. In the last step, the presence of psychological treatment, presence of metastasis, and perceived personal threat of contracting COVID-19 were entered into the equation. These variables were included in the last step of the analysis since the focus of the study was to investigate cancer patients and their unique variables during the pandemic.

Results

Pearson's correlation coefficients for each variable. These coefficients are presented in Table 10. Only the variables that had a correlation coefficient greater than or equal to .30 have been reported here, and correlations between the same scales' sub-scales will not be discussed.

Table 10. Correlation coefficients

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Age 1	1	-.318**	-.322**	-.373**	,187	-,182	-,076	,159	-,109	-,003	-,086	,009	,079	,090	,010	-,115	,007
Gender 2	-.318**	1	-,049	.366**	-,081	,002	,099	-,043	-,070	,045	,062	-,041	,094	,125	,111	-,201	-.252*
Education 3	-.322**	-,049	1	.248*	,206	-,069	,003	,144	,217	-,213	-,173	-,182	-,197	-,092	-,036	,238*	,061
Child 4	-.373**	.366**	.248*	1	,134	-,074	-,064	,111	,012	-,079	-,127	-,101	,032	-,207	,001	-,045	-.235*
Self-confident 5	,187	-,081	,206	,134	1	-.556**	-,012	.734**	,106	-.448**	-.461**	-.446**	-,240*	-,036	,106	-,150	,054
Helpless 6	-,182	,002	-,069	-,074	-.556**	1	,289**	-.463**	-,184	.477**	.531**	.380**	.308**	,011	-,112	,149	-,050
Submissive 7	-,076	,099	,003	-,064	-,012	,289**	1	,236*	-,021	,189	,154	,078	,261*	,122	-,165	,109	-,021
Optimistic 8	,159	-,043	,144	,111	.734**	-.463**	,236*	1	,173	-,265*	-,264*	-,271*	-,143	,160	,055	-,075	,114
Social Support 9	-,109	-,070	,217	,012	,106	-,184	-,021	,173	1	-.372**	-,154	.403**	.420**	,017	,072	,306**	,354*
Emo. Control_T 10	-,003	,045	-,213	-,079	-.448**	.477**	,189	-,265*	-.372**	1	.868**	.902**	.813**	,010	-,145	-,099	-,190
Anger 11	-,086	,062	-,173	-,127	-.461**	.531**	,154	-,264*	-,154	.868**	1	.709**	.505**	,028	-,100	-,031	-,129
Anxiety 12	,009	-,041	-,182	-,101	-.446**	.380**	,078	-,271*	-.403**	.902**	.709**	1	.621**	,047	-,150	-,108	-,116
Depression 13	,079	,094	-,197	,032	-,240*	.308**	,261*	-,143	-.420**	.813**	.505**	.621**	1	-,053	-,127	-,121	-.252*
Psyc. Treatment 14	,090	,125	-,092	-,207	-,036	,011	,122	,160	-,017	,010	,028	,047	-,053	1	,028	,004	,113
Metastasis 15	,010	,111	-,036	,001	,106	-,112	-,165	,055	-,072	-,145	-,100	-,150	-,127	,028	1	-,057	,198
COVID_Threat 16	-,115	-,201	,238*	-,045	-,150	,149	,109	-,075	,306**	-,099	-,031	-,108	-,121	,004	-,057	1	.436*
COVID_Anxiety 17	,007	-.252*	,061	-.235*	,054	-,050	-,021	,114	.354**	-,190	-,129	-,116	-.252*	,113	,198	.436*	1

It was firstly seen that self-confident coping was negatively correlated with the total score of emotional control, control of anger, and control of anxiety. On the other hand, helpless coping was positively correlated with the total score of emotional control,

control of anger, control of anxiety, and control of depressive feelings. Coping through seeking social support was negatively correlated with total score of emotional control, control of anxiety, and control of depressive feelings, while it was positively correlated with perceived personal threat of contracting COVID-19 and pandemic-related anxiety. Finally, the perceived personal threat of contracting COVID-19 was positively correlated with pandemic-related anxiety.

Factors associated with the pandemic-related anxiety levels of cancer patients were identified through regression analysis (Table 11). The analysis included four steps, where variables were entered into the regression equation hierarchically. In the first step, demographic variables, namely age, gender, level of education, and whether to have children were entered into the equation. The variables of the second step were the three sub-scales of the Courtauld Emotional Control Scale; the third step's variables were the five sub-scales of the Coping Style Scale. In the last step, the presence of psychological treatment, presence of metastasis, and perceived personal threat of contracting COVID-19 were entered into the equation.

According to the outcomes of this hierarchical regression analysis to identify factors associated with the anxiety levels of cancer patients, gender was initially entered into the equation [$R2 = .06$, $\beta = -.25$, $t (78) = -2.30$, $p = .024$] and explained 6% of the total variance [$F(1, 78) = 5.30$, $p = .024$]. This indicated that pandemic-related anxiety tended to be higher among women diagnosed with cancer than men. However, age, level of education, and whether to have children did not significantly predict pandemic-related anxiety.

In the second step, control of depressive emotions, which were defined as sadness and grief, were entered into the equation [$\Delta R2 = .05$, $\beta = -.23$, $t (77) = -2.14$, $p = .035$] and raised the explained total variance up to 12% of the total variance [Fchange(1, 77) = 4.60, $p = .035$]. This showed that cancer patients who had lower levels of control over their emotions of sadness and grief had higher pandemic-related anxiety levels. However, control over emotions of anxiety and anger did not significantly predict pandemic-related anxiety.

In the subsequent step of the analysis, seeking social support was entered into the equation [$\Delta R2 = .07$, $\beta = .29$, $t (76) = 2.57$, $p = .012$] and raised the explained total variance up to 19% of the total variance [Fchange(1, 76) = 6.62, $p = .012$]. This indicated that as coping with stress by seeking social support increased, pandemic-related anxiety also increased among cancer patients. However, self-confident, helpless, submissive, or optimistic ways of coping with stress did not significantly predict pandemic-related anxiety.

In the last step, the perceived personal threat of contracting COVID-19 was initially entered into the equation [$\Delta R2 = .10$, $\beta = .33$, $t (75) = 3.16$, $p = .002$] and raised the explained total variance up to 28% of the total variance [Fchange(1, 75) = 9.99, $p = .002$]. This showed that as the perceived personal threat of contracting COVID-19 increased, pandemic-related anxiety also tended to increase among cancer patients. The nonexistence of metastasis was then entered into the regression equation [$\Delta R2 = .06$, $\beta = .25$, $t (74) = 2.54$, $p = .013$] and raised the explained total variance up to 34% of the total variance [Fchange(1, 74) = 6.43, $p = .013$]. This result revealed that metastatic cancer patients tended to have lower levels of pandemic-related anxiety. The presence of psychological treatment, however, did not significantly predict pandemic-related anxiety.

Table 11. Hierarchical regression of factors associated with pandemic-related anxiety

Independent variable	df	F_{change}	t	ΔR^2	R^2	β
I. Demographic variable						
Gender	1, 78	5.30*	-2.30*	.06	.06	-.25
Age						-.08
Level of education						.05
Whether to have children						-.16
II. Emotional Control						
Control of depressive emotions	1, 77	4.60*	-2.14*	.05	.12	-.23
Control of anger						.00
Control of anxiety						.03
III. Coping Style						
Seeking of social support	1, 76	6.62*	2.57*	.07	.19	.29
Self-confident						-.02
Helpless						.04
Submissive						.04
Optimistic						.04
IV. Cancer-Related Variables						
Perceived personal threat for contracting COVID-19	1, 75	9.99***	3.16***	.10	.28	.33
Nonexistence of metastasis	1, 74	6.43*	2.54*	.06	.34	.25
Psychological treatment						.13

Dependent variable: Pandemic-related anxiety; *= $p < .05$, ** = $p < .01$, *** = $p < .001$

Discussion

The COVID-19 pandemic has increased many people's anxiety levels (Hyland et al. 2020, Wang et al. 2020). Since cancer patients are considered to be in the high-risk group and are already struggling with a life-threatening disease, it is essential to investigate this group specifically, as the effects of the pandemic may differ for them when compared to the average population. For this reason, this study examined the psychological factors affecting anxiety levels of cancer patients affected by the COVID-19 pandemic.

According to the analysis results, female cancer patients had higher anxiety levels than male patients during the COVID-19 pandemic. This gender difference is consistent with other studies (e.g., Özdin and Bayrak Özdin 2020, Gurvich et al. 2021, Wang et al. 2021); furthermore, it has been found that women have more post-traumatic stress symptoms during this pandemic period (Liu et al. 2020). As women are more likely to develop anxiety disorders in general (Lewinsohn et al. 1998, McLean et al. 2011, Asher et al. 2017), women have also reported more anxiety during the pandemic period. According to the current study, this gender difference did not change depending on a chronic disease, such as cancer, during the time of the pandemic. In other words, it could be said that the gender difference in terms of anxiety has a more fundamental effect, regardless of whether the person has cancer or not.

There are many studies in the literature showing that suppression of emotions is associated with high levels of anxiety (e.g., Ho et al. 2004, Iwamitsu et al. 2005, Gillanders et al. 2008, Schlatter and Cameron 2010, Karademas et al. 2011). However, the current study has demonstrated that as the control of sadness and grief decreased, pandemic-related anxiety has increased. The reduced control of sadness and grief is associated with more expression and experience of these emotions. It is possible that

cancer patients who cannot control their sadness during the pandemic period could experience great sorrow, and their anxiety related to the pandemic might increase simultaneously. Furthermore, no association was found between the control of anger or anxiety and pandemic-related anxiety. It was thought that the feeling of anger was not as prominent as sadness during this period. The main reason why anxiety control is not associated with pandemic-related anxiety could be that pandemic-related anxiety is different than typical anxiety. The anxiety related to the pandemic has been investigated on the basis of how much the lives of cancer patients are affected during the pandemic period. However, circumstances other than pandemic-related concerns, such as being diagnosed with cancer, seem to be independent of pandemic anxiety.

Styles of coping with stressful situations affect a person's level of anxiety (Folkman and Lazarus 1988, Penley et al. 2002). It is known that active coping styles, such as receiving social support, can facilitate adaptation to stressful situations (Hennig-Fast et al. 2009), and it has been found that social support has a mediating effect on the pandemic experience and stress response during the COVID-19 pandemic (Ye et al. 2020). In the current study, a result was found that differed from the general view found in the literature. According to the present study, as seeking social support as a way to cope with stress increased, pandemic-related anxiety also increased among cancer patients. In a study conducted with healthcare professionals during the pandemic period, people who used social support as a coping mechanism had higher stress levels (Babore et al. 2020). Similarly to the healthcare professionals who constituted the sample of that study, the cancer patients who formed the current study's sample are also at high risk. While they can usually cope by seeking social support, their social support resources are more limited during the pandemic. It was thought that their anxiety levels might have shown an increase as a result of this, as they were unable to implement social support-seeking as a coping mechanism due to the conditions of the pandemic. However, no significant effect of other coping styles has been seen. The use of self-confident, optimistic, submissive, or helpless styles as a coping mechanism was not associated with pandemic-related anxiety among cancer patients. These factors not being related could be the result of the ability of coping mechanisms to maintain their functionality during the pandemic period.

The data also revealed that as perceived personal threat during the COVID-19 pandemic increased, pandemic-related anxiety also increased among cancer patients. This finding is consistent with the literature (Nikčević et al. 2021). It is not surprising that anxiety increases as people's threat perceptions increase. This further shows the importance of threat perception for psychological well-being.

The last finding of this research showed that metastatic cancer patients tended to have lower levels of pandemic-related anxiety. In a study conducted with cancer patients undergoing active treatment processes, cancer diagnoses were perceived as more severe than COVID-19 diagnoses among the cancer patients (Sigorski et al. 2020). In this respect, it seems natural for cancer patients with metastases to be less worried about COVID-19-related factors. It is known that metastasis makes cancer treatment more complicated, and it is also linked to most cancer-related deaths (Steeg 2016). For this reason, patients with metastases may feel the "risk" of COVID-19 less as a result of the already existing threats to their lives.

In conclusion, this study has aimed to provide a better understanding of the psychological factors that affect the anxiety felt by cancer patients due to the COVID-19

pandemic. Although some results have differed from the findings in the pre-pandemic literature, these differences are considered to be the result of the effects that have been created by the pandemic itself. It is thought that this demonstration, of where the pandemic creates different effects on this particular population, will contribute to the understanding of the anxiety experienced by cancer patients during this period.

The most important limitation of this study is its sample size. Since the study was conducted with adults diagnosed with cancer, the participants could be considered a hard-to-reach group. In particular, it was thought that collecting data online rather than face-to-face, as a result of the pandemic, made it significantly more difficult to reach the participants. Repeating the study with a larger sample and conducting a comparison between those undergoing and those not undergoing active treatment processes would further validate the results at hand. Another limitation of this study is that some variables were measured using questionnaires developed by the researchers. In particular, the internal consistency coefficient of the form used to measure personal threat perception regarding COVID-19 transmission was lower than expected. However, it was considered to be an acceptable level due to the low number of items. This method was chosen because there was no previous scale in the literature about the pandemic experiences of cancer patients. Considering the vulnerability of cancer patients as part of the risk group under the conditions of the pandemic, the authors attached particular importance to investigate the psychological difficulties experienced by these individuals and to contribute to providing support in line with the findings before the negative effects of the pandemic gradually multiply. Perhaps for a similar purpose, other researchers used pandemic-specific scales they developed to conduct research on a special group in this sudden-onset process (López-Bueno et al. 2020, Romito et al. 2020, Swainston et al. 2020, Wang et al. 2020). It would be important to repeat the findings with strongly validated measurement tools and to investigate the effect of later stages of the pandemic.

Conclusion

This study carries importance for understanding the anxiety felt by cancer patients, who are a general risk group and are also considered sensitive during the COVID-19 pandemic. Practitioners working with cancer patients during this period can re-evaluate the focus of their practices within the framework of the results presented in this study. This study has determined that, during this pandemic period, a different relationship exists between some variables when compared to what the literature prior to the pandemic has suggested. This result shows that the COVID-19 pandemic may alter the literature.

An important finding that differs from the literature to date is that cancer patients' anxiety about the pandemic increased as their levels of sadness and grief control decreased during the period of the pandemic. Pandemic conditions may limit people's ability to regulate their emotions when they are recognized. Therefore, it is essential to provide interventions to help increase the expression of feelings that are regulated more easily under normal conditions and to use alternative methods that are more appropriate under pandemic conditions. In these conditions, interventions that help people integrate motivating factors into their lives may come to the fore.

Finally, people who use the method of seeking social support as a coping mechanism, people with high threat perceptions, and people without metastases in this particular risk group may be more vulnerable to anxiety during the pandemic. Since social distancing rules also require distancing from sources of social support, these people's coping strategies become less effective. Hence, facilitating the development of alternative coping styles and methods in order to reduce perceived personal risk may gain importance in helping cancer patients become more resilient to pandemic conditions.

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