

# ONLINE COGNITIVE BEHAVIORAL STRESS MANAGEMENT PROGRAM FOR BREAST CANCER PATIENTS

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## ABSTRACT

**Objective:** Breast cancer is a challenging process that affects the diagnosed people and their social environment psychologically, physiologically, socially, and economically. The main purpose of this study is to investigate the effectiveness of the Online Cognitive Behavioral Stress Management (CBSM) for Cancer program, which is structured for people diagnosed with cancer to develop coping methods that will enable them to cope with the stress they experience healthily and actively. The research question is whether attending the CBSM program is effective for the psychological well-being of breast cancer patients or not.






**Material and Method:** The study was completed with a total of 35 people, 17 in the experimental group and 18 in the control group. The pretest-posttest results of the experimental and control groups were analyzed. The independent sample *t*-test was used in the comparison of

the two groups of experimental and control groups. Paired sample *t*-test was used to compare the pretest-posttest scores of each group.

**Results:** There was a significant difference observed between the experimental and control groups in the post-test measurements in terms of psychosocial adjustment to illness, assessment of coping attitudes, depression, hope, state, and trait anxiety ( $p < 0.001$ ). There was no significant difference in the pre-test and post-test scores of the experimental and control groups in terms of mental adjustment to cancer.

**Conclusion:** The CBSM program for breast cancer patients is effective in coping with daily and illness-related stress by increasing psychological well-being: increased psychosocial adjustment, adaptation and decreased depression, and anxiety

**Keywords:** Breast cancer, group therapy, online therapy, cognitive behavioral therapy, stress management.

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## MEME KANSERİ HASTALARI İÇİN ÇEVİRİMİÇİ BİLİŞSEL DAVRANIŞÇI STRES YÖNETİMİ PROGRAMI

### ÖZET

**Amaç:** Meme kanseri, tanı alan kişileri ve sosyal çevrelerini psikolojik, fizyolojik, sosyal ve ekonomik olarak etkileyen zorlu bir süreçtir. Bu çalışmanın temel amacı, kanser tanısı almış kişilerin yaşadıkları stresle sağlıklı ve aktif bir şekilde baş edebilmelerini sağlayacak başa çıkma yöntemleri geliştirmeleri için yapılandırılmış olan Kanser İçin Bilişsel Davranışçı Stres Yönetimi (KDSY) çevrimiçi programının etkinliğini araştırmaktır. Araştırma sorusu, KDSY programına katılmanın meme kanseri hastalarının psikolojik iyi oluşları için etkili olup olmadığıdır.

**Materyal ve Metot:** Çalışma, deney grubunda 17 ve kontrol grubunda 18 olmak üzere toplam 35 kişi ile tamamlanmıştır. Deney ve kontrol gruplarının öntest-sontest sonuçları analiz edilmiştir. Deney ve kontrol

gruplarının karşılaştırılmasında bağımsız örneklem t-testi kullanılmıştır. Her bir grubun ön test-son test puanlarını karşılaştırmak için eşleştirilmiş örneklem t-testi kullanılmıştır.

**Bulgular:** Deney ve kontrol grupları arasında son test ölçümlerinde hastalığa psikososyal uyum, başa çıkma tutumlarının değerlendirilmesi, depresyon, umut, durumluk ve sürekli kaygı açısından anlamlı bir fark gözlenmiştir ( $p<0,001$ ). Deney ve kontrol gruplarının ön-test ve son-test puanları arasında kansere ruhsal uyum açısından anlamlı bir fark bulunmamıştır.

**Sonuç:** Meme kanseri hastaları için KDSY programı, artan psikososyal uyum, adaptasyon ve azalan depresyon ve anksiyete parametreleri ile ölçülen psikolojik iyi oluşu artırarak günlük ve hastalıkla ilişkili stresle başa çıkmada etkili bulunmuştur.

**Anahtar kelimeler:** Meme kanseri, grup terapisi, çevrimiçi terapi, bilişsel davranışçı terapi, stres yönetimi.

### INTRODUCTION

Today, scientists are not only focusing on the medical treatment part of the cancer, but they are also working on the psychosocial parts of life that influence the before, during, and follow-up process of the cancer. According to the World Health Organization, the most common type of cancer in the world is breast cancer.<sup>1</sup> The fact that breast cancer can be seen at any age and can happen to 1 out of every 8 women, there might be increased psychosocial needs of these individuals.<sup>2</sup> During this process, the most important factor that affects psychological well-being is the information about cancer, treatments, and the process.<sup>3</sup> Most of the women diagnosed with breast cancer, start to use avoidance as a coping method.<sup>4</sup> Although avoidance is a functional coping method for a short time, it becomes unfunctional and harmful in the long term. People who use an avoidance coping style for a long time might have emotional and psychological problems such as sleep disorders, mood depression, generalized anxiety, boredom, restlessness, loss of self, and role awareness.<sup>5</sup> Literature shows that mental health professionals focus on studies to increase mental health, adaptation, problem-solving skills, and psychological well-being, strengthen self-confidence and self-perception, and increase psychological resilience.<sup>6,7</sup> They apply individual and group therapies to alleviate the psychological burden of individuals during the cancer treatment process, their families, and the treatment team. All therapy approaches are found effective for the specific needs of

those patients. Cognitive behavioral therapy is one of the most effective psychotherapy approaches during the cancer process in scientific studies, as it focuses on the present, has a solution-oriented structure with a short-term approach, and progresses toward goals.<sup>8,9</sup> Cognitive therapy integrates many different and effective techniques to increase awareness, provide psychoeducation, change dysfunctional thoughts and beliefs, and improve compassion and forgiveness.<sup>7,10</sup>

Cancer is not a disease that a patient can see or touch from outside the body. Its process is not clear and has no certain time or a clear-cut ending day. Cancer is an uncertain illness that brings several changes until it goes away. To cope with this uncertainty, to meet the need for information and to correct false information, and to cope with problems such as anxiety, depression, insomnia, pain, and emotional intensity, a treatment plan that will cover all psychological needs is needed. Cognitive therapy, and its 3<sup>rd</sup> way approach techniques, can address the psychological and culture-specific needs of patients.<sup>7,11,12</sup> Before COVID, studies were mostly conducted in face-to-face treatments. During covid, researchers started to conduct more studies in videoconferencing programs rather than face-to-face ones. In Turkey, videoconferencing therapy studies are limited.<sup>8,9,13-15</sup> The aim of the current study, which was conducted online during the coronavirus pandemic period, is to compare the CBSM for breast cancer program results with whom breast cancer patients don't attend the program.

## MATERIAL AND METHOD

### Design

This study uses a quasi-experimental design, with non-random allocation of participants to experimental and control groups. We implemented a cognitive behavioral stress management program to enhance the psychological well-being of women with breast cancer. The intervention was a group-structured psychoeducational program based on Fawyz's program and Savaş's program.<sup>16-17</sup>

### Samples and Setting

The criteria for participation are being women, diagnosed with any breast cancer, being over 18 years old, and being able to read and understand Turkish. Participants were reached via the snowball method on social media. Data was collected from the participants via Google Forms.

Experimental and control groups were separated according to their cancer stages: 1<sup>st</sup> and 2<sup>nd</sup> stage groups are in one group, and 3<sup>rd</sup> and 4<sup>th</sup> stage groups are in another group. Random assignment is not possible in this study because the allocation of participants into the experimental and control groups is based on their cancer stages (1<sup>st</sup> and 2<sup>nd</sup> stage together and 3<sup>rd</sup> and 4<sup>th</sup> stage together). The grouping is not done randomly, but rather based on a characteristic (cancer stage).

1<sup>st</sup> and 2<sup>nd</sup> stage experimental group was 10 patients, the control group was 12 patients. 3<sup>rd</sup> and 4<sup>th</sup> stage group's experimental group was 7 patients, the control group was 6 patients. In total, 14 patients left the study voluntarily during the study and 35 patients continued until the end of the study. In the last case, data analysis was carried out with a total of 17 experimental and 18 control group participants. Demographic Information Form, Mental Adjustment to Cancer Scale (MAC), The Psychosocial Adjustment to Illness Scale (PAIS), Cope Inventory, Beck Depression Inventory (BDI), Herth Hope Index (HHI), and State-Trait Anxiety Inventory (STAI) were applied to the participants before starting group therapy and after the therapy ended.

CBSM program was applied online over the Skype program for 8 weeks. The groups were planned as closed groups, and no new members were included in the group from the first week. Each session lasted approximately 90 minutes. All groups were led by the same clinical psycho-oncologist (Dr. Esra Savaş). At the same time, 2 assistant clinical psychologists accompanied the process. Scales were collected before and end of the 8 therapy sessions. Figure 1 indicates information about the number of participants in the study. The findings regarding the demographic information of breast cancer stage 1-2 and 3-4 experimental and control group participants are shown in Table 1.

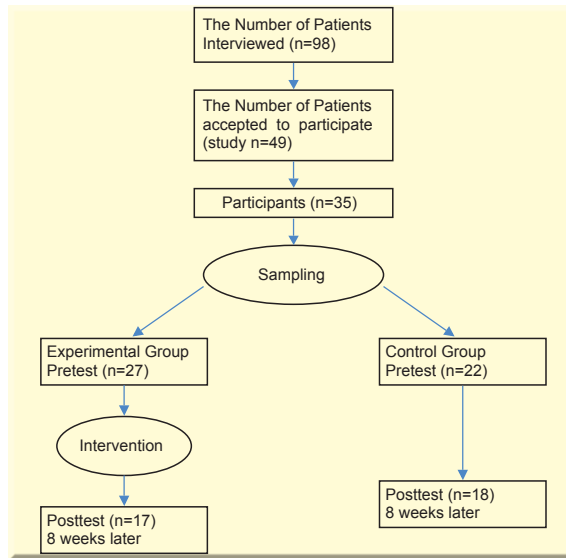


Figure 1. Number of Participants in the Study

Age	Experimental Group 1-2		Control Group 1-2		Experimental Group 3-4		Control Group 3-4		
	:44.50 SD: 8.63		:43.5 SD: 6.27		:46.86 SD: 9.87		37.67 SD: 5.65		
	n	%	n	%	n	%	n	%	
Educational Status	Literate	-	-	-	-	1	14.3	-	-
	Primary education	1	10.0	2	16.7	-	-	-	-
	High school	3	30.0	3	25.0	2	28.6	3	50.0
	Undergraduate/Postgraduate	6	60.0	7	58.3	4	57.1	3	50.0
Marital Status	Married	9	90.0	11	91.7	5	71.4	4	66.7
	Single	1	10.0	1	8.3	1	14.3	1	16.7
	Widow	-	-	-	-	-	-	-	-
	Divorced	-	-	-	-	1	14.3	1	16.7
People Living	Alone	-	-	1	8.3	-	-	1	16.7
	Mom/Dad	2	20.0	-	-	1	14.3	1	16.7
	Spouse/Children	8	80.0	11	91.7	6	85.7	4	66.7
	Close friend	-	-	-	-	-	-	-	-
Working Status	Not working	4	40.0	7	58.3	7	100.0	6	100.0
	working	6	60.0	5	41.7	-	-	-	-
Economic Situation	Low	-	-	-	-	1	14.3	1	16.7
	Middle	7	70.0	10	83.3	5	71.4	5	83.3
	Good	3	30.0	2	16.7	1	14.3	-	-
	Very good	-	-	-	-	-	-	-	-
Health Insurance	No	-	-	2	16.7	-	-	1	16.7
	Yes	10	100.0	10	83.3	7	100.0	5	83.3
Health Status Assessment	I'm terrible	-	-	-	-	-	-	-	-
	I am bad	-	-	-	-	-	-	1	16.7
	Neither good nor bad	3	30.0	4	33.3	5	71.4	4	66.7
	I am good	7	70.0	6	50.0	1	14.3	1	16.7
	I am very good	-	-	2	16.7	1	14.3	-	-

Subjects covered	Main topics	Session
Meeting Sharing program purpose and objectives Sharing the participants' cancer history and expectations from the program	General information	1
Sharing medical information about cancer and general information about being healthy	Health Education	2
Explaining the Personal Support Systems Analogy	Psychological Support	3
Explanation of the components of coping methods	Coping Systems	4
Evaluation of coping methods in the cancer process with real cases (pre-diagnosis, diagnosis process, doctor-patient relationship, body image)	Coping Scenarios	5
Evaluation of coping methods in the cancer process with real cases (depressed mood, interpersonal relationships, communication with friends, returning to normal, planning for the future)	Coping Scenarios	6
Cognitive restructuring studies by separating stress awareness from reactions and thought distortions	Stress Management	7
Implementation of problem solving model, attitude change and progressive muscle relaxation exercises with imagination	Problem Solving, Attemp Changing & Relaxation	8

**Figure 2.** Components of the CBSM for Cancer Program

In the experimental group stage 1 and 2, participants averaged 44.50 years in age, with most in undergraduate/postgraduate education (60%), married (90%), and employed (60%). The majority described their economic situation as moderate (70%), and all had health insurance, with around 70% reporting good health. In the control group, participants averaged 43.50 years of age, with most in university/postgraduate education (58.3%), married (91.7%), and not employed (58.3%). The majority described their economic situation as moderate (83.3%), and most had health insurance (83.3%), with about 50% reporting good health.

In the experimental group stages 3 and 4, participants averaged 46.86 years old, primarily with university/postgraduate education (57.1%), married (71.4%), without jobs, and most described their economic situation as moderate. All had health insurance, and 71.4% considered their health status as neither good nor bad. In the control group, participants averaged 37.67 years old, mostly with university/master's education (50%), married (66.7%), without jobs, and the majority described their economic situation as moderate. Most had health insurance (83.3%), and 66.7% considered their health status as neither good nor bad.

## Inclusion Criteria

The inclusion criteria were being women, after the age of 18, reading and understanding Turkish, and being diagnosed with breast cancer.

## Exclusion Criteria

The exclusion criteria were already receiving psychiatric or psychological treatment and unwilling or unable to participate in the program's 8 sessions in total.

## Intervention Protocol

The research was conducted between March 2022 and April 2022 for 8 weeks. Sessions were organized as a closed group of 90 minutes. Meetings with breast cancer stage 1 and 2 participants started on March 9, 2022 (10.30 on Wednesday) and ended on April 26, 2020. Meetings with breast cancer stage 3 and 4 participants started on March 10, 2022 (10.30 on Thursday) and ended on April 27, 2020. The main topics covered in the sessions are presented in Figure 2.

The intervention was a cognitive behavioral stress management program based on Fawzy's<sup>16</sup> approach and Esra Savaş.<sup>17</sup> Fawzy showed that a structured psychoeducation program would be beneficiary to improve physical training, physical strength, fighting spirit, body image, sufficient information, and decreased sleeping problems.<sup>16</sup> The CBSM program was designed by Dr. Esra Savaş and includes cognitive behavioral techniques and a psychoeducational model to increase the biopsychosocial approaches of the patients. There are not many studies on the effectiveness of this psychoeducation and cognitive behavioral therapy techniques on stress management and psychological well-being in women with breast cancer.

The content of the first session consisted of a meeting, sharing the aims, objectives, and group rules of the program, and sharing the cancer story of the participants and their expectations from the program. The sessions were interactively managed to encourage the participants to use their individual experiences, feelings about cancer, knowledge, and skills that could help to solve problems. The second session's agenda was sharing medical information about cancer and general information about being healthy. In the third session, the Personal Support Systems Analogy was explained. In the fourth session, the components of coping methods were discussed. In the fifth and sixth sessions, virtual case' coping methods during the cancer process (pre-diagnosis,

diagnosis process, doctor-patient relationship, body image) were discussed. In the seventh session, cognitive restructuring techniques were discussed by distinguishing stress awareness, reactions, and thought distortions. In the last session, a problem-solving model, attitude change, and progressive muscle relaxation exercises with imagination were applied. All sessions have a PowerPoint presentation shared with patients by Dr. Esra Savaş, including a summary and assignment parts.

## Measures

### Demographic Information Form

It contains demographic and disease-specific questions such as age, marital status, and education level, created by the researcher, and consists of two parts: "individual characteristics" and "health/disease characteristics".

### Mental Adjustment to Cancer Scale (MAC)

The MAC was developed by Watson and friends to determine the response of cancer patients to cancer and its treatment.<sup>18</sup> Natan conducted the Turkish validity and reliability study, and the 40-item version of the scale was used in this study.<sup>19</sup> The scale consists of 5 sub-dimensions. These sub-dimensions are fighting spirit (FS), Helplessness/Hopelessness (HH), anxious preoccupation (AP), fatalism (FA), and avoidance (AV). In the Turkish validity and reliability study, Cronbach's alpha was found. 72 according to the total score of the scale. The Cronbach alpha reliability coefficients for the subscales ranged from 0.72 to 0.58. Scale items are scored between 1 and 4, and a total of 40 to 160 points can be obtained. Higher scores from each subscale indicate the individual's mental adjustment style.

### The Psychosocial Adjustment to Illness-Self-Report Scale (PAIS-SR)

The scale was developed by Derogatis and Lopez to measure individuals' interactions with others and their sociocultural environment.<sup>20</sup> Turkish validity and reliability study was done by Adaylar.<sup>21</sup> The Cronbach alpha reliability coefficient of the scale in individuals with chronic disease was found to be 0.92 for all items, and this value ranged between 0.78 and 0.96 for sub-dimensions. It has 46 items in total and consists of 7 sections and 7 sub-dimensions. These are health care orientation (Part 1), "Vocational Environment" (Part 2), "Domestic Environment" (Chapter 3), "Sexual Relations" (Chapter 4), "Extended Family" (Chapter 5), "Social Environment" (Chapter 6), and

"Psychological Distress" (Chapter 7). Low scores on the scale represent 'good' psychosocial adjustment, and high scores represent 'bad' psychosocial adjustment. Studies conducted with this scale show that psychosocial adjustment is good, with scores below 35 points from the scale, moderate scores between 35 and 51, and poor scores above 51.

### COPE Inventory

The scale is a self-report scale developed by Carver and friends to evaluate coping responses when faced with difficult, distressing, or stressful situations.<sup>22</sup> The study examining the Turkish psychometric properties of the scale was carried out by Ağargün *et al.*<sup>23</sup> As a result of the study, the Cronbach  $\alpha$  value was found to be 0.79, and it can be said that the scale has high internal consistency and is a reliable scale. Consisting of 60 items and 15 sub-dimensions, this scale is scored with a Likert-type scale between 1-4. A total of 4-16 points can be obtained from each sub-scale. The sum of the scores of the first five of these subscales gives the Problem-Focused Coping score, the sum of the subscale scores from 6 to 10 gives the Emotional-Focused Coping score, and the sum of the last five subscale scores gives the Dysfunctional Coping score. An increase in the scores on the subscales is interpreted as an increase in the coping attitude used.

### Beck Depression Inventory

The scale was developed by Beck *et al.* and revised in 1978.<sup>24</sup> It is a self-report scale that aims to measure the emotional, physical, cognitive, and motivational symptoms of depression. The Turkish validity and reliability study was carried out by Hisli.<sup>25</sup> Consisting of 21 items, the scale is pointed between 0 and 3. The cut-off point was determined as 17 points, and the total score range ranged from 0 to 63. The above 17 points are expressed as depression above normal.

### Herth Hope Index (HHI)

It was developed to determine the level of hope of cancer patients. The Cronbach Alpha value was reported as 0.89 in the reliability analysis performed for the sample consisting of cancer patients. The Turkish validity and reliability study of the scale was carried out by Aslan and friends.<sup>26</sup> Consisting of 30 items, the scale is a 4-point Likert-type scale, scored between 0-3. The scale has 3 sub-dimensions, and these are named "Future", "Positive readiness and expectancy" and "Inter-connectedness". The total hope score can be in the range of 0-90, and an increase in the scores means an increase in the level of hope.

**Table 2.** Comparison of Experimental and Control Group Pre-Test Post-Test Results of Mental Adjustment to Cancer Scale and its Sub-dimensions with Independent and Paired Groups t-Test

		n	(Pre-test)	SD	p	(Post-test)	SD	p	Paired sample p
<b>Mental Adjustment to Cancer Scale</b>	Experimental	17	106.8824	8.60873	0.122	104.5294	12.24805	0.653	0.234
	Control	18	104.8889	7.43512		104.9444	7.75714		0.975
<b>Fighting Spirit (FS) Sub-dimension</b>	Experimental	17	47.1765	4.68021	0.108	49.1765	7.35897	0.117	0.204
	Control	18	47.3333	4.14445		46.2222	3.79714		0.354
<b>Helplessness/Hopelessness (HH) Sub-dimension</b>	Experimental	17	12.2353	3.32659	0.325	10.0000	3.12250	0.315	0.009
	Control	18	11.2778	2.51596		12.1111	2.92834		0.303
<b>Anxious Preoccupation (AP) Sub-dimension</b>	Experimental	17	25.4706	4.10971	0.176	23.2941	3.80402	0.372	0.002
	Control	18	24.8889	3.19722		25.2778	3.19569		0.553
<b>Fatalism (FA) Sub-dimension</b>	Experimental	17	19.4706	3.18429	0.224	20.0588	3.59636	0.102	0.294
	Control	18	18.9444	2.91996		18.8333	3.03412		0.850
<b>Avoidance (AV) Sub-dimension</b>	Experimental	17	2.5294	1.06757	0.405	2.0000	0.93541	0.229	0.034
	Control	18	2.4444	1.04162		2.5000	0.85749		0.790

MAC: Mental Adjustment to Cancer; FS: Fighting Spirit; HH: Helplessness/Hopelessness; AP: Anxious Preoccupation; FA: Fatalism; AV: Avoidance SD: Standart deviation

**Table 3.** Comparison of experimental and control group pre-test post-test results of psychosocial adjustment to illness scale (PAIS) and its subscales with independent and paired groups t-test

		n	(Pre-test)	SD	p	(Post-test)	SD	p	Paired sample p
<b>Psychosocial Adjustment to Illness Scale</b>	Experimental	17	57.5882	19.47132	0.477	47.8235	17.83338	0.001*	0.007
	Control	18	56.6667	16.92544		55.7222	18.33930		0.713
<b>Health Care Orientation Sub-dimension</b>	Experimental	17	9.7059	3.53137	0.623	7.8824	2.59524	0.001*	0.059
	Control	18	8.2778	2.71825		8.7778	3.07849		0.269
<b>Vocational Environment Sub-dimension</b>	Experimental	17	8.8235	2.83362	0.508	7.7647	2.94808	0.119	0.086
	Control	18	8.6111	3.16486		7.7778	2.57946		0.027
<b>Domestic Environment Sub-dimension</b>	Experimental	17	7.8235	4.37658	0.283	6.2353	3.57997	0.001*	0.012
	Control	18	9.2222	4.06644		9.3889	4.39437		0.816
<b>Sexual Relations Sub-dimension</b>	Experimental	17	9.5294	4.79736	0.158	9.6471	4.16745	0.594	0.902
	Control	18	9.7778	5.29767		9.3889	5.60608		0.646
<b>Extended Family Sub-dimension</b>	Experimental	17	3.5882	2.98033	0.288	3.5882	2.80755	0.001*	1.000
	Control	18	4.1667	2.93558		4.3333	2.54374		0.772
<b>Social Environment Sub-dimension</b>	Experimental	17	7.5882	5.43207	0.405	5.7647	5.00661	0.001*	0.033
	Control	18	7.0000	4.22875		7.3889	4.69216		0.568
<b>Psychological Distress Sub-dimension</b>	Experimental	17	10.5294	4.63839	0.602	6.9412	3.30663	0.001*	0.004
	Control	18	9.6111	3.75952		8.6667	4.40588		0.223

\*p<0.05 SD: Standart deviation

### State-Trait Anxiety Inventory

The scale was developed by Spielberger *et al.* and consists of 40 short-worded items.<sup>27</sup> While 20 items measure state anxiety, the other 20 items measure trait anxiety. While the state anxiety scale aims to

evaluate how the person feels in the face of certain situations, the trait anxiety scale aims to examine the general feeling of the individual. Turkish validity and reliability studies were conducted by Necla and Le Compte and the alpha reliability coefficient was found between 0.83 and 0.87 for trait anxiety and between

0.94 and 0.96 for state anxiety.<sup>28</sup> Items 1, 2, 5, 8, 10, 11, 15, 16, 19, and 20 under the State Anxiety Scale in Scoring, and 1, 6, Items 7, 10, 13, 16, 19 contain reversed statements and these items should be reverse coded. After calculating the total score of the direct and reversed items in the scoring, the reversed items are removed from the direct items. Add 50 for State Anxiety and 35 for Trait Anxiety and the anxiety score obtained from the scale is formed.

### Statistical Analysis

SPSS (Statistical Package for the Social Sciences) version 26.0 was used for statistical analysis. The level of significance was taken as  $p=0.05$ . Descriptive statistical indicators in continuous data; mean, standard deviation, frequency, and percentage distributions are given for categorical data. Normal distribution tests Kolmogorov-Smirnov and Shapiro-Wilk Tests were analyzed, and it was determined that normal distribution was provided in the data. For this reason, an independent sample t-test was used in the comparison of the two groups of experimental and control groups. Paired sample t-test was used for difference analysis of pre-post test scores.

### Ethical Considerations

The study protocol was approved by the Ethics Committee of the Istanbul Gelisim University (2021-40 on 24.12.2021). A written informed consent which was approved by the Ethics Committee was obtained from each patient. Furthermore, at the end of the study period, the handbook of the CBSM program was sent to the control group.

## RESULTS

The Independent Groups t-test was used to determine whether the pretest and post-test scores of the participants differed in the Mental Adjustment to Cancer Scale and its subscales. Table 2 shows the pretest and posttest scores of the participants on the MAC and its subscales.

There is no significant difference between the experimental and control groups in terms of pre-test and post-test measurements in the MAC general dimension and its sub-dimensions ( $p>0.05$ ).

The Independent Groups t-test was used to determine whether the experimental and control group pre-test and post-test scores of the participants differed in the Psychosocial Adjustment to Illness Scale (PAIS) and its sub-dimensions. Table 3 shows the pretest and posttest scores of the participants' Psychosocial Adjustment to Illness Scale and its sub-dimensions.

There was no significant difference between the pre-test scores of the experimental and control groups in the PAIS and all subscales. When the post-test results were evaluated, it was observed that there was a statistically significant difference between the groups in the PAIS. Accordingly, the participants in the experimental group showed better psychosocial adjustment to the disease than the participants in the control group ( $p<0.05$ ).

As a result of the comparison of the post-test scores in the Health Care Orientation, Domestic Environment, Extended Family, Social Environment, and Psychological Distress sub-dimensions, according to the experimental and control groups, a statistically significant difference was found between the groups ( $p<0.05$ ). However, there were no significant differences between experimental and control group in terms of Vocational Environment and Sexual Relations sub-dimensions ( $p>0.05$ ).

The Independent Groups t-Test was used to determine whether the experimental and control group pre-test and post-test scores of the participants differed in the COPE Inventory and its sub-dimensions. Table 4 shows the pretest and post-test scores of the participants' COPE Inventory and its subdimensions.

There was no significant difference between the pre-test scores of the experimental and control groups in the Cope Inventory of all its subscales. When the post-test results were evaluated, it was observed that there was a statistically significant difference between the groups in the COPE Inventory ( $p<0.05$ ). No statistically significant difference was found between the groups in the General Dimension of Emotionally Focused Coping ( $p>0.05$ ). It was observed that there was a statistically significant difference between the groups in the General Dimension of Problem-Focused Coping and Dysfunctional Coping ( $p<0.05$ ).

When the post-test scores of the sub-dimensions were evaluated; it was observed that there was a statistically significant difference between the groups in the positive reinterpretation and growth, Use of instrumental social support, Active coping, Use of emotional social support, acceptance and planning sub-dimensions ( $p<0.05$ ). However, there was no statistically significant difference between the groups in the mental disengagement, focus on and venting of emotions, denial, religious coping, humor, behavioral disengagement, restraint, substance use and suppression of competing activities sub-dimensions ( $p>0.05$ ).

<b>Table 4.</b> Comparison of Experimental and Control Group Pre-Test Post-Test Results of COPE Inventory and its Subscales with Independent and Paired Groups t-Test									
		n	(Pre-test)	SD	p	(Post-test)	SD	p	Paired sample p
<b>COPE Inventory</b>	Experimental	17	148.9412	21.08753	0.227	162.1176	23.63758	0.001*	0.000
	Control	18	148.5000	19.65062		148.2778	26.45486		0.001
<b>Emotion-Focused Coping General Dimention</b>	Experimental	17	44.7647	9.93434	0.488	47.5294	11.45162	0.516	0.431
	Control	18	44.6111	4.74204		46.1111	7.47458		0.547
<b>Problem-Focused Coping General Dimention</b>	Experimental	17	57.6471	8.55089	0.672	61.0000	5.36190	0.001*	0.228
	Control	18	56.2778	9.60885		55.1667	10.64535		0.729
<b>Dysfunctional Coping General Dimention</b>	Experimental	17	46.5294	7.12494	0.337	53.5882	8.75399	0.001**	0.030
	Control	18	47.6111	9.01071		47.0000	10.64950		0.855
<b>Positive Reinterpretation and Growth</b>	Experimental	17	12.1176	2.93433	0.362	13.8235	1.66716	0.001*	0.064
	Control	18	12.1111	2.39826		11.9444	2.53150		0.835
<b>Mental Disengagement</b>	Experimental	17	11.4118	2.47636	0.574	11.7059	1.68689	0.445	0.689
	Control	18	10.8889	2.63213		10.5000	2.50294		0.533
<b>Focus on and Venting of Emotions</b>	Experimental	17	10.8824	1.86689	0.309	11.1176	2.61922	0.287	0.790
	Control	18	10.9444	2.66728		10.5556	2.61719		0.568
<b>Use of Instrumental Social Support</b>	Experimental	17	11.7647	2.19458	0.178	13.4118	2.50147	0.001*	0.579
	Control	18	11.7778	2.94170		11.5556	3.09121		0.810
<b>Active Coping</b>	Experimental	17	11.4706	2.29449	0.409	12.9412	1.29762	0.001*	0.046
	Control	18	10.5556	1.97699		10.6111	2.45282		0.945
<b>Denial</b>	Experimental	17	6.8824	2.52196	0.731	6.8235	3.55730	0.566	0.957
	Control	18	7.2778	2.46876		6.8889	2.69834		0.581
<b>Religious Coping</b>	Experimental	17	12.5882	3.77589	0.103	13.4706	3.39333	0.115	0.039
	Control	18	12.2222	3.49042		12.4444	3.68179		0.776
<b>Humor</b>	Experimental	17	9.2941	3.58407	0.372	10.4706	3.44815	0.586	0.189
	Control	18	8.3333	3.00979		9.0556	4.07968		0.470
<b>Behavioral Disengagement</b>	Experimental	17	7.1176	3.17967	0.499	6.7647	3.38248	0.470	0.758
	Control	18	6.8889	2.27231		7.3333	1.94029		0.457
<b>Restraint</b>	Experimental	17	8.8824	2.47190	0.398	10.0000	3.27872	0.271	0.270
	Control	18	9.8889	1.99673		10.3889	2.14583		0.537
<b>Use of Emotional Social Support:</b>	Experimental	17	9.0000	2.71570	0.368	11.1176	2.99755	0.001*	0.002
	Control	18	10.1667	3.68223		9.3889	3.38055		0.483
<b>Substance Use</b>	Experimental	17	4.5882	1.00367	0.390	5.2353	2.65823	0.150	0.336
	Control	18	5.1667	1.85504		6.0556	3.90282		0.280
<b>Acceptance</b>	Experimental	17	11.4706	2.34834	0.339	13.2941	2.08461	0.001*	0.056
	Control	18	11.8889	2.47074		11.1667	2.79179		0.484
<b>Suppression of Competing Activities</b>	Experimental	17	9.5294	2.23935	0.246	10.7059	2.95306	0.213	0.214
	Control	18	9.1111	2.02598		9.6667	2.78652		0.556
<b>Planning</b>	Experimental	17	11.9412	2.86074	0.358	13.2353	1.71499	0.001*	0.123
	Control	18	11.2778	3.10229		10.7222	2.19104		0.489

\*p<0.05 SD: Standart deviation

<b>Table 5.</b> Comparison of Experimental and Control Group Pre-Test Post-Test Results of Beck Depression Inventory with Independent and Paired Groups t-Test									
		n	(Pre-test)	SD	p	(Post-test)	SD	p	Paired sample p
<b>Beck Depression Inventory</b>	Experimental	17	19.5294	10.03193	0.001*	13.1176	9.70749	0.001*	0.001*
	Control	18	17.2778	8.07906		16.2778	7.08607		0.080

\*p<0.05 SD: Standart deviation



**Table 6.** Comparison of Experimental and Control Group Pre-Test Post-Test Results of Herth Hope Index with Independent and Paired Groups T-Test

		n	(Pre-test)	SD	p	(Post-test)	SD	p	Paired sample p
<b>Herth Hope Index</b>	Experimental	17	61.7059	16.77336	0.385	71.4706	16.38260	0.001*	0.011
	Control	18	61.8889	13.55116		59.1111	13.54682		0.201
<b>Future Sub-dimension</b>	Experimental	17	19.7059	6.53610	0.461	23.0000	6.58597	0.001*	0.060
	Control	18	19.6667	6.66863		18.8333	6.16680		0.289
<b>Positive Readiness and Expectancy Sub-dimension</b>	Experimental	17	19.7059	6.10087	0.193	23.2941	5.70925	0.001*	0.013
	Control	18	20.7778	4.47944		19.7778	4.16647		0.158
<b>Inter-connectedness Sub-dimension</b>	Experimental	17	22.2941	5.35916	0.671	25.1765	4.73333	0.001*	0.007
	Control	18	21.4444	4.94942					0.385

\*p<0.05 SD: Standart deviation

**Table 7.** Comparison of Experimental and Control Group Pre-Test Post-Test Results of State-Trait Anxiety Inventory with Independent and Paired Groups T-Test

		n	(Pre-test)	SD	p	(Post-test)	SD	p	Paired sample p
<b>State-Trait Anxiety Inventory</b>	Experimental	17	91.4706	19.78357	0.113	78.1765	19.87849	0.001*	0.009
	Control	18	93.5556	16.97826		96.2222	16.39424		0.299
<b>State Anxiety</b>	Experimental	17	43.7059	11.27921	0.581	33.5882	11.86939	0.001*	0.002
	Control	18	42.8889	9.20287		42.6667	9.73774		0.897
<b>Trait Anxiety</b>	Experimental	17	47.7647	10.20741	0.448	44.5882	9.15190	0.001*	0.172
	Control	18	50.6667	8.91793		53.5556	8.26205		0.058

\*p<0.05 SD: Standart deviation

The Independent Groups' t-test was used to determine whether the experimental and control group pre-test and post-test scores of the participants differed in the BDI. Table 5 shows the pretest and posttest scores of the participants' BDI.

According to the study findings, there was a significant difference between the experimental and control groups in terms of BDI pretest-posttest scores. In the pre-test results, the depression score of the experimental group was higher than the control group ( $p < 0.05$ ). In the post-test, it was found that the depression score of the experimental group was lower than the control group ( $p < 0.05$ ).

The Independent Groups t-Test was used to determine whether the experimental and control group pre-test and post-test scores of the participants differed in the Herth Hope Index (HHI) and its sub-dimensions. Table 6 shows the pretest and posttest scores of the participants' HHI and its sub-dimensions.

There was no significant difference between the experimental and control groups in terms of pre-test scores on the Herth Hope Scale and its subscales ( $p > 0.05$ ). When the post-test results were evaluated,

it was observed that there was a statistically significant difference between the groups in the General Dimension of the Herth Hope Scale ( $p < 0.05$ ). It was also observed that there was a statistically significant difference between the groups in the Future, Positive readiness and expectancy and Inter-connectedness sub-dimensions ( $p > 0.05$ ).

The Independent Groups t-test was used to determine whether the experimental and control group pre-test and post-test scores of the participants differed in the State-Trait Anxiety Inventory. Table 7 shows the pretest and posttest scores of the participants' STAI and its sub-dimensions.

According to the study findings, there was no significant difference between the experimental and control groups in the pretest scores of the State-Trait Anxiety Scale General Dimension, State Anxiety Sub-Dimension and Trait Anxiety Sub-Dimension ( $p > 0.05$ ). When the post-test results were evaluated, it was observed that there was a statistically significant difference between the groups in the General Dimension of the State-Trait Anxiety, State Anxiety sub-dimension and Trait Anxiety ( $p < 0.05$ ).

**Table 8.** Multiple Linear Regression Analysis Results Regarding Psychosocial Adjustment to Illness Prediction

Predictor	B	Standard Error	$\beta$	t	p	95%CI
Constant	58.455	22.529		2.595	0.015	12.228-104.681
Mental Adjustment to Cancer	-0.108	0.173	-0.060	-0.626	0.536	1.107-1.243
Cope	-0.061	0.063	-0.085	-0.964	0.344	-0.464-0.247
Depression	1.046	0.276	0.486	3.789	0.001	-0.190-0.068
Hope	-0.164	0.149	-0.144	-1.106	0.278	0.480-1.613
State and Trait Anxiety	0.363	0.186	0.201	1.954	0.061	-0.469-0.141
Age	0.436	0.209	0.189	2.086	0.047	0.007-0.864
Economic Status	-11.912	3.641	-0.307	-3.272	0.003	-19.382--4.441

R=0.902 R<sup>2</sup>=0.814 F(7,27)=16.856 p<0.001

While the model explained a substantial amount (81.4%) of the variance in psychosocial adjustment ( $R^2=0.814$ ,  $F(2,27)=16.85$ ,  $p<0.001$ ), depression ( $\beta =-0.486$ ,  $p<-0.001$ ), age ( $\beta =*0.189$ ,  $p<0.05$ ) and economic status ( $\beta =-0.307$ ,  $p<0.05$ ) were significant predictors of psychosocial adjustment (Table 8).

A unit increase in depression score is likely to result in the increase of psychosocial adjustment score by 1.046 ( $b=1.046$ ). A unit increase in age is likely to result in the increase of psychosocial adjustment score by 0.436 ( $b=0.436$ ). Good economic status is likely to result in an decrease of psychosocial adjustment score by 11.912 ( $b=-11.912$ ). It should be taken into consideration that in the psychosocial adjustment scale, low scores on the scale represent 'good' psychosocial adjustment, and high scores represent 'bad' psychosocial adjustment.

## DISCUSSION

This study aims to see the effectiveness of individuals with breast cancer on their psychological well-being by participating in the CBSM program. The participants of the CBSM program met through videoconference as a closed group of 90 minutes, once a week, throughout the week. Participants in the control group filled out the scales on the same date as the experimental group, after 8 weeks without any intervention. When comparing the pretest and posttest results of the 2 groups, mental adjustment to cancer, psychosocial adjustment to illness, coping attitudes, depression, hope, and state-trait anxiety levels were examined.

When the pre-test and post-test results for the psychosocial adjustment of the participants are compared, it is seen that the psychosocial adjustment of the participants in the experimental group increased compared to the control group. Similarly, Hoybye *et al.* and Eryrenci's, participants of the group therapy showed improvements in psychosocial adjustment

and mood.<sup>29,30</sup> This can be explained by the liberation towards their selves, such as the feeling of being understood, realizing that they are not alone, and being able to express themselves without hesitation, without judgment, since they are with other people of the same sex who have breast cancer. Montazer, Salehzadeh, Nasirian stated that the intervention that included forgiveness in strategies based on acceptance had a positive effect on the psychological adjustment of breast cancer patients.<sup>31</sup> Soylu stated that individuals participating in group therapies provide good self-expression, seeing that they are understood, emotional relief, psychological support, and financial comfort.<sup>32</sup> Participating cognitive behavioral group may also have facilitated the participants' perceived belonging and their adaptation to the disease, treatment, and team with the psychosocial support they received.

Coping strategies are associated with psychological stress, cortisol, and the immune system. In particular, passive coping with stress is associated with a weak immunity.<sup>33</sup> The results of the online cognitive behavioral group therapy for cancer patients, which was developed to improve coping strategies, it was seen that the experimental group used positive reinterpretation and growth, use of instrumental social support, active coping use of emotional social support, acceptance and planning strategies more than the control group in the pre-test-post-test results applied to determine the methods of coping with stress. Similarly, Joaquín-Mingorance and friends stated in their study of women with breast cancer that active coping was the strategy with the highest score.<sup>34</sup> In the study of Boatemala and friends with breast cancer women, the most and least adopted active coping strategies were religious coping and humor, respectively.<sup>35</sup> Distraction and substance use were the most and least adopted avoidant coping strategies, respectively. In the literature, psychotherapeutic strategies reduced the stress levels of the participants, their coping methods became functional, and they developed positive skills.<sup>36,37</sup> The fact that the program improves the methods of coping with stress can also be explained by the increase in psychosocial adjustment, and the decrease in depression, anxiety, and hopelessness. The online CBSM for breast cancer program provides a problem-solving method and cognitive restructuring in situations that can be changed; learning relaxation exercises with an attitude change, practicing with the opportunity to practice for 8 weeks in daily life, presenting the congestion situations directly to the specialist in the next group in situations that cannot be changed may have provided effectiveness in coping with stress.

Studies showed that during the breast cancer process, women have higher depressive symptoms than noncancer women and cognitive therapy is effective in decreasing those depressive symptoms in breast cancer patients.<sup>38</sup> The perspective of women on cancer diagnosis is an effective factor on their depression levels. When the effect of participating in the online CBSM for breast cancer program on the level of depression was evaluated, it was found that the depression levels of the experimental group participants decreased after 8 weeks, while those in the control group were found to be stable. This finding is like the studies in the literature.<sup>39</sup> In the meta-analysis study of telehealth interventions for people diagnosed with cancer between 2015 and 2019, only 2 of 8 studies on depressive symptoms did not show a statistically significant difference. According to the cognitive theory, depression is the individual's negative perception of the past, present, and future.<sup>24</sup> The fact that individuals in the cancer process have changed their thoughts about negative perceptions in their biopsychosocial process with cognitive therapy techniques and functionalized their coping methods may have been achieved with the effectiveness of the online CBGT for Cancer program.

When the pre-test and post-test results for the anxiety levels of the participants are compared, it is seen that the anxiety levels of the individuals in the experimental group decreased compared to the control group. Yavuşsen also found a similar decrease in anxiety levels in group therapy.<sup>38</sup> This situation can be explained by the fact that the feeling of anxiety and related cognitions are replaced by cognitive therapy techniques, and the anxiety that rises in daily life is replaced by functional coping methods instead of avoidance. The scenarios in the online CBGT for Cancer program were written specifically to explore how avoidance at every stage of the cancer process negatively affects psychological well-being. In addition, listening to the scripts from the therapist, enabling the participants to discover the possible functional methods of avoidance behaviors, noticing their avoidance in their own life during that week's homework, and asking them to take notes may have reduced anxiety.

Hope is important to everyone throughout the cancer process. Hope is associated with lower levels of depression and stress, resulting in better coping and post-traumatic growth.<sup>40</sup> In the meta-analytic study, it was found that the level of hope gradually decreased between 2010 and 2020 and that more studies were needed to increase it.<sup>37</sup> When the pre-test and post-test results of the online CBSM for Cancer program

participants were compared, it was seen that the hope scores of the individuals in the experimental group increased compared to the control group. Hope is directly related to cognitions. It is necessary to ensure that the current and future cognitions of individuals in the cancer process, especially about their diseases, are full of hope. The increase in hope in individuals participating in the online CBGT for Cancer program can be explained by the fact that their cognitions for their health perception and future have been restructured with cognitive therapy techniques, by internalizing active and functional coping methods in scenario sessions, increasing their quality of life and strengthening the social support of being in the group. An increase in hope level and psychosocial adjustment, decrease in depression and anxiety levels also support each other. Similarly, Yavuzsen stated that the hopelessness levels of breast cancer patients decreased after attending group therapy.<sup>38</sup>

Comparing the pre-post test results of the mental adjustment to cancer results, it was found that being in the experimental and control groups was not sufficient for change. Similarly, Simpson, Carlson, Trew reported that they did not find a significant difference in the way they mental adjustment to cancer between the experimental and control groups in the cognitive behavioral psychosocial intervention program applied to women who completed stages 0, 1, and 2 breast cancer treatment. The lack of significant results in response to cancer in this study can be explained by the fact that the intervention applied is not directly related to the adjustment to cancer but is related to stress management. It may be related to the fact that all the studies where there is a difference were conducted face-to-face, and that this study was a program implemented remotely. The change in the response style to cancer can be explained by environmental factors such as the absence of a stressor such as COVID-19 in a face-to-face environment where attention and focus are high. As a disadvantage of being able to participate online even while receiving chemotherapy at the hospital or on the go, the change may not have occurred.

It is known that during the breast cancer process, women have problems with their sexual identity and sexual life.<sup>36</sup> However, in the Online CBSM program for breast cancer application study, it was observed that there was no significant difference in the vocational environment and sexual relations, on one of the psychosocial adjustment subscales. The reason might be not including specific scales about information about sexual identity and sexuality.

## Limitations

The inclusion of only women with breast cancer in the study limits the generalizability of the findings to patients with other cancer types and demographic profiles. The limited number of participants (n=35) is another limitation of the study. Quality of life is one of the important factors in the cancer process and was not included in the measurement in this study. A limitation is that measurements were not taken 6, 12, and 24 months after the application to evaluate whether the application was effective for a long time.

A significant limitation of this study is the non-randomized group assignment. Participants were grouped into experimental and control groups based on their cancer stages rather than through random assignment. This non-random grouping method limits the ability to make causal inferences. Differences in baseline characteristics between the groups may exist, and these differences could confound the results, making it challenging to attribute any observed effects solely to the cognitive behavioral stress management program. The lack of randomization also hinders the generalizability of the findings beyond this specific group of participants, as the groups may not be representative of the broader population of women with breast cancer. Future research with randomized group assignments could help mitigate these limitations and strengthen the validity of the study's findings.

## CONCLUSIONS

In the process that starts with the diagnosis of cancer, there are psychological and medical changes specific to the treatment, the individual, and the cancer. These changes and the medical, social, and psychological needs that arise during the process occur. Individual or group psychotherapy approaches are used. Especially

the therapies in the group setting are at the forefront as they also address social needs. This study enabled women with breast cancer to be together in groups for 8 weeks for 90 minutes via the online platform. Considering the results, it was found that the online CBSM program for Cancer program is a program that can enable people diagnosed with breast cancer to cope with the stress they experience healthily and actively. Participating in the online CBSM program for Cancer program has increased psychological well-being in many areas. Adaptation and coping methods are factors that directly affect mood. If the individual believes that s/he can cope with a new problem, his/her mood is positively affected. In summary, participating in the online CBSM program for Cancer program has increased individuals' psychological well-being through both group interaction and psychoeducation with cognitive behavioral therapy and Socratic questioning; improvement in coping methods, reduction in stress, depression, and anxiety levels, and increase in psychosocial adjustment.

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## Author Contribution

ES: group intervention, data duration, formal analysis, writing-original draft, writing-review and editing, and visualization. MK: data analysis, participation follow-up, writing-review and editing. ÖT: participation follow-up, writing, review.

All authors read and approved the final manuscript.

\*The authors declare that there are no conflicts of interest.

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