ISSN: 2717-8161 RESEARCH ARTICLE

New Trend Med Sci 2024; 5(2):73-83. https://dergipark.org.tr/tr/pub/ntms

# Psychological Impact of COVID-19 Pandemic in Patients with Cancer and the Relation with Traumatic Events, Difficulty in Emotion Regulation and Social Support

Ebru Karci[1*], Ozcan Sonmez[2], Alper Cagri Karci[3], Eser Sagaltici[4], Meyha Sahin[5]

[1]Department of Medical Oncology, Medipol Mega University Hospital, İstanbul, Türkiye
[2]Department of Internal Medicine, Atlas University Medicine Hospital, İstanbul, Türkiye
[3]Department of Endocrinology and Metabolism, Medipol Mega University Hospital, İstanbul, Türkiye
[4]Department of Psychiatry, Bagcilar Research and Training Hospital, University of Health Sciences, İstanbul, Türkiye
[5]Department of Infectious Diseases and Clinical Microbiology, Medipol Mega University Hospital, İstanbul, Türkiye

***Article History***
Received 23 Jan 2024
Accepted 22 May 2024
Published Online 30 May 2024

[*]***Corresponding Author***
Ebru Karci
Department of Medical Oncology
Medipol Mega University Hospital
İstanbul, Türkiye.
Phone: +90 5055173710
E-mail: dr.ebrkarc@yahoo.com.tr

***Doi:***10.56766/ntms.1424151

***Authors' ORCIDs***
Ebru Karci
http://orcid.org/0000-0001-8802-6376
Ozcan Sonmez
http://orcid.org/0000-0002-1998-8069
Alper Cagri Karci
http://orcid.org/0000-0002-5917-5628
Eser Sagaltici
http://orcid.org/0000-0002-4217-2658
Meyha Sahin
http://orcid.org/0000-0003-4147-3587



**Abstract:** We aimed to investigate the psychological effect of the COVID-19 pandemic in cancer patients and its relationship with traumatic events, difficulty in emotion regulation and social support during the COVID-19 Pandemic. This cross sectional study was conducted with 149 patients diagnosed with cancer. Patients between the ages of 18 and 75 who were diagnosed with any type of cancer and received active chemotherapy treatment during the Covid-19 pandemic period in the oncology outpatient clinic were evaluated with various psychological assessment tools and scales. Patients were assessed with Post-Traumatic Stress Disorder Checklist (PTSDCL), Depression, Anxiety and Stress Scale for DSM-5 (DASS-21), Adverse Childhood Experiences Scale (ACE), Stressful Life Events List do to Pandemic, Difficulty in Emotion Regulation Scale-Short Form (DERS), Multidimensional Scale of Perceived Social Supports(MSPSS). 92 (61.7%) of the 149 participants were female and 118 (79.2%) were married. The median age was 51 years. 66 (%44.3) experienced moderate-to-severe distress on any or more of the DASS-21 scales. High DERS-Goals levels and SELP scores were the major components determining high PTSD severity ($p<0.001$ and $p=0.004$ respectively). Moreover, higher DERS-Strategies, DERS-Goals and ACE scores showed significant parallelism with higher depression severity ($p=0.008$, $p=0.007$ and $p=0.009$ respectively). Higher anxiety level was found to be significantly correlated with higher DERS-Goals scores and lower MSPSS-Family scores ($p<0.001$ and $p=0.038$ respectively). Stress severity level was statistically significantly correlated to DERS-Goals and DERS-Clarity scores ($p<0.001$ and $p=0.033$). A considerable proportion of patients presenting with PTSD, depression, anxiety and stress disorder was mainly impressed regarding difficulty engaging in goal-directed behavior (DERS-Goals). These findings emphasize the importance of targeted psychosocial interventions to address the unique needs of cancer patients. Childhood adversities, emotion regulation difficulties, and social support especially from the families should be considered for the patients with cancer during the pandemic to prevent them from negative outcomes. ©2024 NTMS.

**Keywords:** Pandemic; Cancer; Traumatic Events; Difficulty in Emotion Regulation; Social Support.

**Cite this article as:** Karci E, Sonmez O, Karci AC, Sagaltici E and Sahin M. Psychological impact of COVID-19 pandemic in patients with cancer and the relation with traumatic events, difficulty in emotion regulation, and social support. *New Trend Med Sci.* 2024: 5(2):73-83.Doi:10.56766/ntms.1424151.

## 1. Introduction

Corona Virus Disease 2019 (COVID-19) was first detected in December 2019 as a new pneumonia causing respiratory infection in Wuhan, China [1, 2]**.** This COVID-19 pandemic has created an unprecedented change in the social and ordinary lives of people around the world. The psychological status of some special groups has been more affected by the pandemic [3-5]. Particularly those with chronic diseases were the more affected populations [5, 6]. Patients with cancer may be particularly vulnerable to more severe disease due to immune-suppressed states resulting from the underlying malignancy itself, as well as reduced immunity from treatments for cancer, additional medical comorbidities, and malnutrition [6]. While the psychological status of cancer patients was affected by the pandemic, it was started to be investigated which patients were more at risk and what the protective factors were. Some of the risk factors were reported as having a history of mental disorder, excessive alcohol consumption, more frequent concern about cancer treatment due to COVID-19, and having high levels of fatigue, pain and stressfull life events [5]. The better quality of life and good relationships with family members were reported as protective factors.

One of the negative psychological consequences of the pandemic is post-traumatic stress disorder (PTSD). In the current pandemic, the rate of probable PTSD was reported as 31.6% in a study conducted on 187 oncology patients [7]. It can be expected that the increasing distress, associated to anxiety, stress and depression, with the pandemic will negatively affect the already difficult life of cancer patients. Previous studies have shown that increased levels of distress can lead to decreased satisfaction with care and non-adherence to treatment, lower survival rates, a desire to accelerate death, and poor quality of life for both patients and their relatives [8, 9].

Emotion regulation, which is predicted as an important factor affecting the social interactions especially during difficult modifications in life-style conditions, it is the ability to manage the emotions experienced and the way these emotions are expressed [10]. It is known that individuals who experience negative emotions and show psychopathological effects basically have ineffective coping strategies [11]. Emotion regulation was found to be a critical mediator of resilience in cancer and to significantly predict the quality of life change during the pandemic [12, 13].

In line with the above, it is important to define the psychological symptoms of cancer patients during the COVID-19 pandemic. In addition, it will be guiding to investigate the relationship between psychological status of the patients during pandemic and intertwined factors such as trauma, emotion regulation, and social support, which are related to both the pandemic and resilience. Actually we planned a study to not only filling a gap in the literature but also addressing a crucial aspect of epidemic management, its psychosocial component. The potential to provide effective social and psychological support in future epidemics can contribute significantly to the well-being of affected communities and enhance our overall resilience in the face of health crises. Therefore, in this study, the psychological effect of the COVID-19 pandemic in cancer patients and its relationship with traumatic events, difficulty in emotion regulation and social support will be investigated.

## 2. Material and Methods

The study was conducted with patients diagnosed with cancer who applied to the Health Sciences University Bağcılar Training and Research Hospital, Medical Oncology Clinic and Chemotherapy Unit between July 01 and September 01, 2020, during the period when the pandemic was most intense, hospitalizations and deaths were at the highest, and COVID-19 vaccines were not yet available and met the criteria for inclusion in the study. Inclusion criteria for the study were; being diagnosed with any type of cancer, being between the ages of 18 and 75, and being voluntarily agree to participate in the study. Exclusion criteria in the study were; pregnancy, illiteracy, having a serious psychiatric or neurological disease that may affect decision-making, not having the mental capacity to understand the questions asked, having a major additional psychiatric disorder (Schizophrenia, Bipolar Disorder, Mental Retardation, Alcohol-Substance Addiction). The purpose of the study was explained to the patients, and they were asked whether they would participate in the study voluntarily, and informed consent forms were obtained from those who agreed to participate before the study. This study was approved by the ethics committee of Istanbul Bağcılar Training and Research Hospital with reference number 2020.07.1.02.095 and was conducted in accordance with the Declaration of Helsinki.

Patients were assessed with 1. 'Post-Traumatic Stress Disorder Checklist' and 'Depression, Anxiety and Stress Scale-2 for DSM-5' to evaluate psychological symptoms, 2.To assess traumatic experiences a) ACE Childhood Trauma Score for traumatic experiences up to 18 years of age, b) Life Events Checklist-5 for the period between 18 years age and the onset of pandemic c) Stressful Life Events Inquiry List for the Pandemic Process, 3. Difficulty in Emotion Regulation Scale-Short Form, 4. Multidimensional Scale of Perceived Social Supportş, and 5. Sociodemographic and clinical characteristics form have been applied. 160 patients were included in the study 11 patients were excluded

because they filled in the forms incompletely. The analyzes of the study were performed based on 149 patients.

*2.1. Socio-demographic and Clinical Characteristics Form*

There are 9 items in the form prepared by the authors in line with the research purpose. With these items, the participants' age, gender, marital status, education level, age when they were diagnosed with cancer, duration of disease, type of cancer and whether they received treatment for cancer were obtained.

*2.2. Adverse Childhood Experiences Scale (ACE)*

*This scale* developed in order to question the adverse experiences in childhood during the first 18 years of life by Permanente, such as domestic emotional violence, physical violence, sexual violence, abuse, emotional and physical neglect, and questioning of divorce. These self report scale is a 10-item scale. Each item specified as ''Yes'' is considered 1 score, and is summed to obtain the total score. Turkish validity and reliability study was performed by Gündüz et al. in 2018 [14].

*2.3. Stressful Events List due to Pandemic*

The scale was prepared by authors, using the Stressful Life Events Screening Questionnaire [15] and review of the literature, and used to measure the stressful life event burden during the pandemic. The scale consists of 18 questions answered as yes or no (no:0 point, yes:1 point), and total score ranges from 0 to 18. Higher scores on the scale are associated with stressful event burden (see Supplementary Table 1). Cronbach's alpha internal consistency coefficient was determined as 0.76.

*2.4. Life events checklist for DSM-5 (LEC-5)*

The LEC-5 is a self-report measure designed to screen for lifetime traumatic events. The LEC-5 assesses exposure to 16 events known to potentially result in PTSD or distress and includes one additional item assessing any other extraordinarily stressful event not captured in the first 16 items [16]. The LEC-5 was validated with the Turkish sample [17]. In this study, the Cronbach Alpha internal consistency reliability coefficient of the scale was determined as 0.96.

*2.5. Post Traumatic Stress Disorder Checklist (PTSDCL) for DSM-5*

It is a self-reported scale consisting of 20 questions, each item scored between 0 and 4, to assess the severity of PTSD symptoms. High score indicates increased PTSD symptom severity [18]. The Turkish validity and reliability study was conducted by Boysan et al. [17]. In this study, the Cronbach Alpha internal consistency reliability coefficient of the scale was determined as 0.96.

*2.6. Depression, Anxiety and Stress Scale-Short Form-21 (DASS-21)*

The scale was developed to measure the symptoms of depression, anxiety and stress in both clinical samples and normal samples. There are 7 items in total for each factor. The scale has a 5-point Likert-type response format and the lowest score that can be obtained from each dimension is 7 and the highest score is 35. Increasing scores on the scale indicate an increase in symptoms [19]. The Turkish adaptation of the scale was made by Sarıçam (2018) [6]. In the DASS-21 guideline, scores of DASS-D≥7, DASS-A≥5, or DASS-S>9 are interpreted as at least moderate distress [21]. In this study, the Cronbach Alpha internal consistency reliability coefficient of the scale was determined as 0.88 for depression, 0.82 for anxiety and 0.85 for stress.

*2.7. Difficulties in Emotion Regulation Scale-Short Form (DERS-16)*

The scale was developed by Bjureberg et al. in 2016 [22]. It measures the difficulty levels of individuals in emotion regulation. The scale consists of 16 items in a 5-point Likert type (0=almost never, 4=almost always). The five-factor scale has sub-dimensions of openness, goals, drive, strategies, and rejection. The Turkish adaptation of the scale was carried out by Yiğit and Yiğit [23]. While the internal consistency coefficient was found to be 0.92 in the original study, this value was found to be 0.92 in the adaptation study. In this study, an internal consistency coefficient was found to be 0.89 for the overall scale.

*2.8. The Multidimensional Scale of Perceived Social Support (MSPSS)*

The scale evaluates the adequacy of social support from three different sources: family, friends and a private other, and consists of 12 items of 7 Likert type. The lowest score that can be obtained from the subscales is 4, and the highest score is 28. The lowest score is 12 and the highest score is 84 obtained from the total scale A high score indicates that perceived social support is high [24]. Reliability and validity study of the scale was made by Eker and Arkar in Turkey [25]. In the current study, the Cronbach Alpha internal consistency coefficient for the whole scale was found to be 0.94. The Cronbach Alpha internal consistency coefficient obtained for the 'a special person' sub-factor was 0.95, 0.94 for the 'family' sub-factor and 0.96 for the 'friend' sub-factor.

*2.9. Statistical Analyses*

Descriptive statistics were presented in median values and interquartile ranges (IQR) (25% to 75%) for the quantitative variables, and frequencies and percentages for the categorical variables. Normality tests were carried out by using one-sample Kolmogorov–Smirnov

and Shapiro-Wilk tests and through histogram graphs. To assess the relationship between variables Spearman's (rs) correlation analysis was used. Multiple linear regression models were used with stepwise method to investigate potentially predictive factors for the PTSS, depression, anxiety and stress symptoms severity in the patients with cancer. The variables evaluated were determined as significant variables derived from our results and literature review, in accordance with clinical experience. The tests for assumptions-linearity, homoscedasticity and multicollinearity were carried out by the authors (assumptions met). All the analyses were 2-sided with alpha of 0.05, and performed with SPSS statistical software (IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp.).

## 3. Results

The demographic-clinical characteristics of participants are summarized in Table 1. 92 (61.7%) of the 149 participants were female and 118 (79.2%) were married. The median age was 51 years (IQR=44.25 to 61 years), age of diagnosis 49 years (IQR=41 to 58 years), and time since current diagnosis was 13 months (IQR=6 to 36 months).

Cancer type of 57 patients were (38.3%) breast, 39 (26.2%) esophageal/gastrointestinal, 9 (6.0%) lung, and 44 (29.5%) others.

Psychometric properties for self-rating scales and subscales of participants are summarized in Table 2. The medians of PCL-5 total score, intrusions, avoidance, NACM and hyperarousal were 23 (IQR=8 to 41.5), 6 (IQR=2 to 10), 2 (IQR=0 to 4), 8 (IQR=2 to 14.5) and 6 (IQR=2 to 13), respectively. The medians of depression, anxiety, and stress were 3 (IQR=1 to 6), 3 (IQR=1 to 6), and 5 (IQR=2 to 8), respectively. The medians of DERS total score, clarity, goals, impulsiveness, and strategies non-acceptance were 29 (IQR=22 to 39), 4 (IQR=3 to 6), 7 (IQR=4 to 10), 5 (IQR=3 to 7), 8 (IQR=5 to 12) and 5 (IQR=3 to 7), respectively. The medians of MSPSS total score family, friends, and special person were 66 (IQR=47.5 to 82.5), 28 (IQR=24 to 28), 22 (IQR=14 to 28), and 20 (IQR=10 to 28), respectively. The medians of SELP, LEC-5, and ACE scores were 3 (IQR=2 to 5), 2 (IQR=1 to 4), and 0 (IQR=0 to 2), respectively.

According to DASS-21 scale 33 participants (%22.1) had depressive symptoms, 54 participants (%36.2) had anxiety symptoms, and 29 participants (% 19.5) had stress symptoms at least moderate level. 66 (%44.3) experienced moderate-to-severe distress on any or more of the DASS-21 scales.

A positive correlation was found between PCL-5 and SELP (rs=.388, p<0.001), LEC-5 (rs=.210, p<0.05) and ACE (rs=.166, p<0.05). A positive correlation was found between DERS total score and PCL-5 (rs=.361, p<0.001), clarity (rs=.221, p<0.001), goals (rs=.358, p<0.001), impulsiveness (rs=.340, p<0.001), strategies (rs=.348, p<0.001), and non-acceptance (rs=.379, p<0.001). While there was a negative significant correlation between PCL-5 and the family subscale of MSPSS (rs=-.230, p<0.001), No significant correlation was found between MSPSS total score (rs=-.092, p>0.05), friends (rs=-.045, (p>0.05) and special person (rs=-.028, p>0.05) (Table 3).

**Table 1:** Demographic and clinical characteristics.

| Variables | n (%)/ Median (IQR) |
|---|---|
| Age, years | 51 (44.25-61) |
| Gender | |
| Female | 92 (61.7) |
| Male | 57 (38.3) |
| Marital status | |
| Married | 118 (79.2) |
| Single | 15 (10.1) |
| Widowed/Divorced | 16 (10.7) |
| Education | |
| Literate | 29 (19.5) |
| Primary education | 83 (55.7) |
| High school and above | 37 (24.8) |
| Age of diagnosis, years | 49 (41-58) |
| Time since diagnosis, months | 13 (6-36) |
| Cancer type | |
| Breast | 57 (38.3) |
| Esophageal/gastrointestinal | 39 (26.2) |
| Lung | 9 (6.0) |
| Others | 44 (29.5) |
| Present treatment | |
| Any treatment[a] | 102 (68.5) |
| Follow-up | 47 (31.5) |

[a]: Chemotherapy, Surgery, Radiation, Hormone therapy or combined.

A positive correlation was found between depression and SELP (rs=.274, p<0.001) and LEC-5 ($r_S$=.189, p<0.05). Depression was found to be positively correlated with DERS total score ($r_s$=.473, p<0.001), clarity ($r_s$=.425, p<0.001), goals ($r_s$=.473, p<0.001), impulsiveness ($r_s$=.331, p<0.001), strategies ($r_s$=.414, p<0.001) and non-acceptance ($r_s$=.377, p<0.001). A negative relationship was found between depression and MSPSS total score (rs=-.238, p<0.001), family (rs=-.257, p<0.001), friends (rs=-.209, p<0.05) and special person (rs=-.170, p<0.05) (Table 3).

Multiple linear regression analysis was carried out for predicting PTSD, Depression, Anxiety and Stress severity in patients with cancer (Table 4). High DERS-Goals levels (p<0.001) and SELP scores (p=0.004) predicted high PTSD severity (N=149, R2=0.222, F(2, 146)=20.85, p<0.001). High DERS-Strategies (p=0.008), DERS-Goals (p=0.007) and ACE (p=0.009) scores predicted high depression severity (N=149, R2=0.358, F(3,145)=26.94, p<0.001). High COURSE-Goals scores (p<0.001) and low MSPSS-Family scores (p=0.038) predicted high anxiety severity (N=149, R2=0.260, F(2,146)=25.61, p<0.001) -Goals (p<0.001) and DERS-Clarity (p=0.033) scores predicted high stress severity (N=149, R2=0.243, F(2,146)=23.42, p<0.001).

**Table 2:** Psychometric Properties for Self-Rating Scales and Subscales.

| *Scales* | *Median (IQR)* | *[95% CI; Lower-Upper]* |
|---|---|---|
| PCL-5 total score | 23 (8-41.5) | [20-29] |
| Intrusions | 6 (2-10) | [5-7] |
| Avoidance | 2 (0-4) | [2-3] |
| NACM | 8 (2-14.5) | [6-10] |
| Hyperarousal | 6 (2-13) | [5-9] |
| DASS-Depression | 3 (1-6) | [2-4] |
| DASS-Anxiety | 3 (1-6) | [2-4] |
| DASS-Stress | 5 (2-8) | [4-6] |
| DERS-total | 29 (22-39) | [27-31] |
| Clarity | 4 (3-6) | [4-4] |
| Goals | 7 (4-10) | [6-8] |
| Impulsiveness | 5 (3-7) | [4-5] |
| Strategies | 8 (5-12) | [7-9] |
| Non-acceptance | 5 (3-7) | [4-6] |
| MSPSS-total | 66 (47.5-82.5) | [60-70] |
| Family | 28 (24-28) | [27-28] |
| Friends | 22 (14-28) | [19-25] |
| Special Person | 20 (10-28) | [16-23] |
| SELP | 3 (2-5) | [3-4] |
| LEC-5 | 2 (1-4) | [2-3] |
| ACE | 0 (0-2) | [0-1] |

PCL-5: Posttraumatic stress disorder checklist for DSM-5; SELP: Stressful Events List due to Pandemic; LEC-5: Life Events Checklist for DSM-5; DERS: Difficulties in Emotion Regulation Scale; ACE: Adverse childhood experiences; MSPSS: Multidimensional Scale of Perceived Social Support.

**Table 3:** Correlation analysis results.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. PCL-5 | - | | | | | | | | | | | | | | | |
| 2. Depression | .502† | - | | | | | | | | | | | | | | |
| 3. Anxiety | .526† | .715† | - | | | | | | | | | | | | | |
| 4. Stress | .560† | .714† | .639† | - | | | | | | | | | | | | |
| 5. SELP | .388† | .274† | .266† | .324† | - | | | | | | | | | | | |
| 6. LEC-5 | .210* | .189* | .214† | .089 | .122 | - | | | | | | | | | | |
| 7. ACE | .166* | .128 | .136 | .082 | .043 | .222† | - | | | | | | | | | |
| 8. Clarity | .221† | .425† | .272† | .383† | .290† | .119 | .165* | - | | | | | | | | |
| 9. Goals | .358† | .473† | .435† | .409† | .395† | .270† | .043 | .562† | - | | | | | | | |
| 10. Impulsiveness | .340† | .331† | .319† | .353† | .263† | .310† | .123 | .432† | .628† | - | | | | | | |
| 11. Strategies | .348† | .414† | .356† | .336† | .367† | .302† | .051 | .454† | .725† | .663† | - | | | | | |
| 12. Nonacceptance | .279† | .377† | .343† | .261† | .266† | .283† | .109 | .457† | .604† | .587† | .773† | - | | | | |
| 13. DERS-total | .361† | .473† | .416† | .401† | .405† | .315† | .112 | .650† | .874† | .794† | .900† | .818† | - | | | |
| 14. Family | -.230† | -.257† | -.260† | -.174* | -.214† | -.225† | -.110 | -.164* | -.246† | -.061 | -.177* | -.283† | -.219† | - | | |
| 15. Friends | -.045 | -.209* | -.151 | -.129 | -.032 | -.155 | -.164* | -.240† | -.225† | -.150 | -.182* | -.254† | -.233† | .498† | - | |
| 16. Special Person | -.028 | -.170* | -.162* | -.125 | -.078 | -.172* | -.248† | -.238† | -.208* | -.130 | -.160 | -.130 | -.213† | .426† | .693† | - |
| 17. MSPSS-total | -.092 | -.238† | -.204* | -.168* | -.109 | -.208* | -.231† | -.271† | -.261† | -.163* | -.208* | -.247† | -.268† | .625† | .888† | .908† |

Spearman's $r_s$ correlations; *p <0.05; †p <0.001. PCL-5: Posttraumatic stress disorder checklist for DSM-5; SELP: Stressful Events List due to Pandemic; LEC-5: Life Events Checklist for DSM-5; DERS: Difficulties in Emotion Regulation Scale; ACE: Adverse childhood experiences; MSPSS: Multidimensional Scale of Perceived Social Support.
Note: Clarity, Goals, Impulsiveness, Strategies and Nonacceptance are subscales of DERS. Family, Friends and Special Person are subscales of MSPS.

**Table 4:** Multiple linear regression analyses for psychological symptoms severity.

| | Unstandardized Coefficients | | | | | 95% CI | | |
|---|---|---|---|---|---|---|---|---|
| | B | SE | ß | t | p | Lower Bound | Upper Bound | VIF |
| PTSS[1] | | | | | | | | |
| DERS-Goals | 1.960 | 0.466 | 0.333 | 4.209 | <0.001 | 1.040 | 2.880 | 1.174 |
| SELP | 1.683 | 0.581 | 0.229 | 2.899 | 0.004 | 0.536 | 2.831 | 1.174 |
| Depression[2] | | | | | | | | |
| DERS-Strategies | 0.224 | 0.083 | 0.288 | 2.698 | 0.008 | 0.060 | 0.387 | 2.577 |
| DERS-Goals | 0.329 | 0.120 | 0.291 | 2.731 | 0.007 | 0.091 | 0.567 | 2.567 |
| ACE | 0.374 | 0.140 | 0.179 | 2.661 | 0.009 | 0.096 | 0.651 | 1.020 |
| Anxiety[3] | | | | | | | | |
| DERS-Goals | 0.421 | 0.069 | 0.450 | 6.121 | <0.001 | 0.285 | 0.557 | 1.064 |
| MSPSS-Family | -0.096 | 0.046 | -0.154 | -2.091 | 0.038 | -0.188 | -0.005 | 1.064 |
| Stress[4] | | | | | | | | |
| DERS-Goals | 0.449 | 0.105 | 0.367 | 4.272 | <0.001 | 0.241 | 0.657 | 1.424 |
| DERS-Clarity | 0.416 | 0.193 | 0.185 | 2.151 | 0.033 | 0.034 | 0.798 | 1.424 |

B: Unstandardized Coefficients; SE: Standard Error of the Estimate; β: Adjusted Coefficients; CI: Confidence Interval; VIF: Variance inflation factor.
BRS: Brief resilience scale. DERS: Difficulties in Emotion Regulation Scale; SELP: Stressful Events List due to Pandemic; ACE: Adverse childhood experiences; MSPSS: Multidimensional Scale of Perceived Social Support.
[1]:N = 149, $R^2$ = 0.222, F(2, 146) = 20.85, p <0.001. [2]:N = 149, $R^2$ = 0.358, F(3, 145) = 26.94, p <0.001. [3]:N = 149, $R^2$ = 0.260, F(2, 146) = 25.61, p <0.001. [4]:N = 149, $R^2$ = 0.243, F(2, 146) = 23.42, p <0.001.

## 4. Discussion

In this study, developed psychological symptoms were detected in patients diagnosed with cancer during the pandemic, and their relationship with traumatic experiences, difficulty in emotion regulation and social support was determined. The main findings of the study are discussed in the following topics.

First, 44.3% of the participants experienced moderate-to-severe distress on any or more of the DASS-21 scales. It has been previously reported that the psychological impact was high and that the pandemic could reveal stress and anxiety in cancer patients [5].e.g. overwhelming psychological pressure from COVID-19 was found to be the predominant risk factor for mental issue problems in patients with cancer [5]. Similarly, the stressful life events associated with the pandemic was positively correlated with anxiety, stress and depression, and difficulties in emotion regulation. Moreover, stressful life events associated with the pandemic and the goals sub-dimension of DERS was predicted high PTSD severity. In other words, the increased distress of the patients with the pandemic and the increased difficulty in engaging in goal directed cognition and behavior when the patient distressed seem to increase the risk of possible PTSD in cancer patients during the pandemic.

In the regression analysis of this study, adverse childhood experiences were found to be predictive only for the severity of depressive symptoms. It has been determined that negative childhood experiences can change the way traumatic events in adulthood are experienced [26]. Exposure of children's developing brains to stress can result in permanent impairment of multiple neurological structures and functions and psychological vulnerability [27]. This biological change may have resulted in an increased vulnerability to subsequent pandemic stress as well as the development of depression.

It was determined that social support received from the family predicted low anxiety while the goals sub-dimension of DERS was predicted high anxiety. Social relations at every stage of life maintain its importance[28]. Especially in this pandemic period, individuals who can provide social support have been limited due to quarantines, and the family has come to the fore. And the expected result showed that family support can be protective against anxiety during the pandemic.

It was found that goals and clarity sub-dimension of DERS was predicted high stress severity in patients with cancer during the pandemic. These subscales can be interpreted as: increased difficulty in engaging in goal directed cognition and behavior when the patient distressed and lack of emotional clarity seem to increase stress. Considering the relationship between difficulty in emotion regulation and the risk of PTSD and stress, emotion regulation should be an issue that must be addressed during therapies.

In a study conducted with breast cancer patients by Massicotte et.al., it was revealed that cancer patients experience a significant number of stressors related to the COVID-19 pandemic, mostly associated with increased psychological symptoms including higher levels of anxiety, depressive symptoms, insomnia, and fear of cancer recurrence [29]. They also emphasized that their study data had relevancy with the vulnerability of cancer patients toward experiencing a significantly higher level of psychological distress during pandemic periods and with the need to increase access to relevant professional psychosocial support opportunities [29].On the other hand, this study did not delve into the origins of the factors that cause this incerased stress and lack a comparison with the underlying factors. In another study, in July 2020 Wang and his colleagues made a significant contribution to the literature regarding the epidemiology of mental health problems among patients with cancer during COVID-19 pandemic. This article was distinct in its approach due to two significant developmental dimensions, and the first one highlights the central role of pandemic-related data. This approach is likely to contribute to a comprehensive understanding of the situation by integrating various epidemiological factors complicating both the cancer disease itsel and the preferred treatment modalities [30]. Both this study and the later one conducted by Tsamakis et.al. appeared to uncover a notable prevalence of mental health problems among cancer patients and mentioned that the ongoing pandemic has contributed to increased challenges and mental health concerns for cancer patients [30, 31]. These findings underscore the importance of addressing mental health issues in the context of cancer care, particularly considering the additional stressors posed by the COVID-19 pandemic.

One of the most important outcomes of our study is the difference in terms of previously described significant effect of adverse childhood experiences on psychosocial problems in cancer patients during the covid 19 pandemic. In a recently published article, Montague et al. reported that a noteworthy connection between cancer patients and Adverse Childhood Experiences (ACEs). The statement emphasizes the importance of adopting a trauma-informed care approach during the treatment of cancer patients who have a history of ACEs [32]. Likewise, in several studies conducted on various types of cancer patients, including lung, colorectal and cervical cancer, ACEs were reported as one of the main stressors in mental health problems encountered during especiallt chemotherapy period and posed also an important negative impact on healing period both physically and mentally [30-34]. On the other hand, our study revealed that in a stressfull life time period like COVID-19 pandemic, stressor factors conducting the mental health course may show manifest modifications. We found that within all four parameters that we had evaluated, PTSD, anxiety, depression and stress, effective in determining mental health and psychosocial status of cancer patients, difficulties engaging in goal-directed behaviour and limitation access to emotion regulation strategies are the main factors predicting the overall

scene. Childhood adversities were an important factor in depressive disorders of cancer patients but emotion regulation difficulties and lack of support refers to problems that make psychosocial recovery difficult or impossible to occur during the difficult time periods like pandemics. Psychosocial recovery especially in oncological patient population, involves addressing not only the physical aspects of well-being but also the psychological and social dimensions. Recognizing and managing emotions, especially in the face of difficulties, is integral to this process. Adequate support, whether from friends, family, or mental health professionals, plays a crucial role in helping individuals navigate and overcome these challenges.

Another interesting outcome of the present study is the emphasis on the relationship between childhood traumas and depression during the pandemic, but while there is a significant positive correlation between childhood traumas and depression, these traumas are ranked at the bottom of the list of risk factors during the pandemic period. This finding implies that, despite the correlation between childhood traumas and depression, other factors may have a more pronounced impact on mental health during the pandemic. Identifying and understanding the various risk factors can contribute to a more nuanced comprehension of the complex interplay between past traumas and current mental health outcomes, especially in the context of challenging situations like a pandemic.

## 5. Conclusion

This study put forth the importance of the childhood adversities, emotion regulation difficulties, and social support especially from the families for the patients with cancer during the pandemic to prevent them from negative outcomes. Emotion regulation strategies should be used in therapies for patients with cancer to protect them from PTSD. Considering the mental health of cancer patients under pandemic conditions, negative childhood experiences of cancer patients should also be taken into account during psychiatric interviews. It is recommended to provide psychological support to increase the communication within the family and the social support received from the family.

**Limitations of the Study**

The first limitation of this study is the absence of a control group. Due to the cross-sectional nature of the study, we analyzed psychosocial effects of COVID-19 pandemic on a specialized group of patients treated for any type of cancer at a time period when the pandemic was at its highest level and in one of the regions where it was most active. The second limitation is that the questionnaires are self-assessment and the psychopathologies could not be directly detected through a structured interview. Finally, this study's data had not been strengthened by a COVID-19 stressor questionnaire, since there was no Turkish validation of such questionnaires at the time period when the study was conducted.

ACE (Adverse Childhood Experiences) and LEC-5 (Life Events Checklist for DSM-5) are tools used to assess different life events and childhood traumas. Although they examine interrelated psychological dimensions, they cover different constructs and focus areas. Therefore, their simultaneous use in the analysis of the same group in a study does not inherently lead to multicollinearity issues. However, interpreting these tests together during the COVID-19 period may indeed pose challenges due to the unique circumstances of the pandemic. The unprecedented stressors and traumatic experiences associated with the COVID-19 period may complicate the interpretation of results from the ACE and LEC-5 assessments. This is one of the limiting factors of our study.

**Acknowledgement**

None.

**Conflict of Interests**

The authors declare that they have no competing interest.

**Financial Support**

This study received no external funding.

**Author Contributions**

Conceived and designed the experiments; EK. Analyzed and interpreted the data; ES. Contributed reagents, materials, analysis tools or data; EK, OS, MS, ACK. Wrote the paper; EK. Study of biostatistics; ES. Review and editing: ACK.

**Ethical Approval**

This study was approved by the ethics committee of Istanbul Bağcılar Training and Research Hospital with reference number 2020.07.1.02.095 and was conducted in accordance with the Declaration of Helsinki

**Data sharing statement**

All data relevant to the study are included in the article.

**Consent to participate**

Consent for the study was obtained from all participants for the study.

**Informed Statement**

The patient who agreed to participate in the study signed the informed consent form.

## References

1. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. *Lancet.* 2020; 395(10223):470-73.
2. Chan JF-W, Yuan S, Kok K-H et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. *Lancet*. 2020; 395(10223):514-23.
3. Sahin SK, Arslan E, Atalay UM, Demir B, Elboga G, Altindag A. Psychological impact of COVID-19 outbreak on health workers in a university hospital in Turkey. 2021; Psychology, Health & Medicine:1-10.
4. Bahadirli S, Sagaltici E. Burnout, Job Satisfaction, and Psychological Symptoms Among Emergency Physicians During COVID-19 Outbreak: A Cross-

Sectional Study. *Practitioner*. 2021; 83(25.1):20.28-29.

**5.** Wang Y, Duan Z, Ma Z, Mao Y et al. Epidemiology of mental health problems among patients with cancer during COVID-19 pandemic. *Transl Psychiatry*. 2020; 10(1):1-10.

**6.** González-Montero J, Valenzuela G, Ahumada M, Barajas O, Villanueva L. Management of cancer patients during COVID-19 pandemic at developing countries. *WJCC*. 2020; 8(16):3390.

**7.** Miaskowski C, Paul SM, Snowberg K et al. Stress and symptom burden in oncology patients during the COVID-19 pandemic. *JPSM*. 2020; 60(5):e25-e34.

**8.** Anuk D, Özkan M, Kizir A, Ozkan S. The characteristics and risk factors for common psychiatric disorders in patients with cancer seeking help for mental health. *BMC Psychiatry*. 2019; 19(1):1-11.

**9.** Breitbart W, Rosenfeld B, Pessin H et al. Depression, hopelessness, and desire for hastened death in terminally ill patients with cancer. *Jama*. 2000; 284(22):2907-11.

**10.** Koole SL. The psychology of emotion regulation: An integrative review. *Cogn Emot*. 2009; 23(1):4-41.

**11.** Tekin MS, Özdemir N, Şahin ŞK. Effect of attachment styles, emotional regulation difficulty and mindful attention levels on treatment motivation in patients with substance use disorder. *J Subst Use.* 2021; 26(4):441-48.

**12.** Vaughan E, Koczwara B, Kemp E, Freytag C, Wilson T, Beatty L et . Exploring emotion regulation as a mediator of the relationship between resilience and distress in cancer. *Psychosoc Oncol.* 2019; 28(7):1506-12.

**13.** Panayiotou G, Panteli M, Leonidou C. Coping with the invisible enemy: The role of emotion regulation and awareness in quality of life during the COVID-19 pandemic. *JCBS*. 2021; 19:17-27.

**14.** Gündüz A, Yaşar AB, Gündoğmuş İ, Sevran C, Konuk E. Çocukluk çağı olumsuz yaşantılar ölçeği türkçe formunun geçerlilik ve güvenilirlik çalışması. *Anadolu Psikiyatri Dergisi.* 2018; 19(1):68-75.

**15.** Wolfe J, Kimerling R, Brown PJ, Chrestman KR, & Levin K (1996). Psychometric review of the life stressor checklist-revised. In Stamm BH (Ed.), *Measurement of stress, trauma, and adaptation* (pp. 198–201). Lutherville, MD: Sidran Press.

**16.** Weathers FW, Blake DD, Schnurr PP, Kaloupek DG, Marx BP, Keane TM. The life events checklist for DSM-5 (LEC-5). Instrument available from the National Center for PTSD at www.ptsd.va.gov; 2013.

**17.** Boysan M, Guzel Ozdemir P, Ozdemir, Selvi Y, Yilmaz E, Kaya N. Psychometric properties of the Turkish version of the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders, (PCL-5). *Psychiatry Clin Psychopharmacol.* 2017; 27(3):300-10.

**18.** Weathers FW, Litz BT, Keane TM, Palmieri PA, Marx BP, Schnurr PP. The PTSD Checklist for DSM-5 (PCL-5). Scale available from the National Center for PTSD website: http://www.ptsd.va.gov; 2013.

**19.** Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behav Res Ther.* 1995; 33(3):335-43.

**20.** Sarıçam H. 2018. The psychometric properties of Turkish version of Depression Anxiety Stress Scale-21 (DASS-21) in health control and clinical samples. availeble at: https://openaccess.dpu.edu.tr/xmlui/handle/20.500.12438/2183

**21.** Lovibond SH, Lovibond PF. Manual for the depression anxiety stress scales: Psychology Foundation of Australia; 1996. pp 1-42.

**22.** Bjureberg J, Ljótsson B, Tull MT et al. Development and validation of a brief version of the difficulties in emotion regulation scale: the DERS-16. *JPBAB*. 2016; 38(2):284-96.

**23.** Yiğit İ, Yiğit MG. Psychometric properties of Turkish version of difficulties in emotion regulation scale-brief form (DERS-16). *Curr Psychol*. 2019; 38(6):1503-11.

**24.** Zimet GD, Dahlem NW, Zimet SG, Farley GK. The multidimensional scale of perceived social support. *JPA*. 1988; 52(1):30-41.

**25.** Eker D, Arkar H, Yaldız H. Factorial structure, validity, and reliability of revised form of the multidimensional scale of perceived social support. *Türk Pisikiyatri Derg.* 2001; 12(1):17-25.

**26.** Wilson-Genderson M, Heid AR, Cartwright F, Pruchno R. Adverse childhood experiences, adult trauma, and depressive symptom trajectories. *Aging Ment Health.* 2022;26(11): 2170-78.

**27.** Howard ARH, Parris S, Hall JS et al. An examination of the relationships between professional quality of life, adverse childhood experiences, resilience, and work environment in a sample of human service providers. *CYSR*. 2015; 57:141-48.

**28.** Yalçın İ. İyi oluş ve sosyal destek arasındaki ilişkiler: Türkiye'de yapılmış çalışmaların meta analizi. *Türk Psikiyatri Derg.* 2015; 26(1):21-32.

**29.** Massicotte V, Ivers H, Savard J. COVID-19 pandemic stressors and psychological symptoms in breast cancer patients. *Curr Oncol*, 2021; 28(1):294-300.

**30.** Wang Y, Duan, Z, Ma Z, et al. (2020). Epidemiology of mental health problems among patients with cancer during COVID-19 pandemic. *Transl Psychiatry*. 2020; 10(1):263.

**31.** Tsamakis K, Gavriatopoulou M, Schizas D, et al. Oncology during the COVID-19 pandemic: challenges, dilemmas and the psychosocial impact

on cancer patients. *Oncol Letter*. 2020; 20(1):441-47.

**32.** Montague R, Canning SE, Thielking P et al. Adverse childhood experiences and psychotropic medication prescription among cancer patients. *J Psychosoc Oncol*. 2023; 21:1-15.

**33.** Brown DW, Anda RF, Felitti VJ et al. Adverse childhood experiences are associated with the risk of lung cancer: a prospective cohort study. *BMC Public Health.* 2010; 10(1):1-12.

**34.** Alcalá HE, Keim-Malpass J, Mitchell E. Colorectal cancer screening and adverse childhood experiences: Which adversities matter? *Child Abuse Negl.* 2017; 69:145-50.

**35.** Alcalá HE, Mitchell E, Keim-Malpas J. Adverse childhood experiences and cervical cancer screening. *J Women's Health*. 2017; 26(1):58-63.