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ORIGINAL ARTICLE

# Traumatic Cognitions of Oncology Patients and Their Assumptions Regarding The World

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**OBJECTIVE**
The present study aims to determine the traumatic cognition of oncology patients and their assumptions about the world and the influencing factors.

**METHODS**
This study is a descriptive and correlation-seeking study that was conducted between May 2016 and January 2017 on 249 oncology patients. The data were collected using the "Personal Information Form", "Post-Traumatic Cognitions Scale (PTCS)" and "World Assumptions Scale (WAS)".

**RESULTS**
About 34% of the participants are between the ages of 55 and 65, and 33% have acute/chronic leukemia. The highest score from the PTCS scale was obtained from breast-lung cancer patients with a mean of 158.61±36.65. A statistically significant difference was found between the diagnoses of the participants and the mean scores of the PTCS total, all subscales of PTCS, and the subscales of WAS regarding belief in personal luck, belief in the goodness of the world, and belief that the world is fair ($p<0.05$). The WAS and the PTCS had a moderate negative correlation ($r=-0.565$).

**CONCLUSION**
The high traumatic cognition of oncology patients, regardless of the diagnosis, indicates that cancer is a traumatic disease. Increasing cancer patients' assumptions about the world decrease traumatic cognitions.

**Keywords:** Cancer; cognition; consultation-liaison psychiatry nursing; trauma; world assumptions.


## Introduction

According to the world cancer statistics, cancer cases 9.6 million cancer deaths and 18.1 million new cases occur annually.[1] The International Agency for Research on Cancer estimates that cancer cases will rise to 22 million by 2030.[2] It is reported that the prevalence of cancer in the world is 20%. It is 270/100 thousand in males, 173/100 thousand in females, and 222/100 thousand in the total population in Turkey. According to the 2009 data of the National Cancer Report of the Turkish Academy of Sciences, it is stated that nearly 160,000-180,000 new cancer diagnoses are made every year in Turkey and these values are above the world average.[3] The prevalence of mental disorders in cancer patients varies between 30% and 60%.[4-6]

Individuals diagnosed with cancer can be diagnosed with adjustment disorders, depressive syndromes, panic disorder, phobias, and post-traumatic stress disorder (PTSD) during the illness, and they

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may experience emotional problems such as social isolation, insecurity, lack of empathy, impending death/guilt thought, dysphoric mood similar to depression, and loss of sleep quality.[7-10]

Life-threatening diseases are evaluated under the title of PTSD in DSM-5 diagnostic criteria. Due to being life-threatening, the diagnosis of cancer is a cause of mental trauma.[11-13] Traumas negatively can affect the individual's sense of security, sense of control, self-regulation, interpersonal relationships, and stress responses and can reveal mental health problems.[14,15] In a study conducted with cancer patients, the rate of PTSD was found to be 19%. In the present study, the PTSD ratio of patients receiving chemotherapy was higher than those who did not.[16] Cognitive functions and cognitions are important in patients diagnosed with cancer. Cancer-related cognitive impairment is one of the important issues affecting the quality of life. The clinical prevalence of cognitive impairment due to cancer diagnosis and especially cancer treatment varies between 17% and 75%. Despite the high prevalence of cognitive impairment, diagnosis and treatment remain largely inadequate.[17]

Cognitions in trauma and cancer disease processes are similar, and these cognitions are listed as intense fear and helplessness.[9] Cognition is a process including the interpretation of sensory inputs, their storage in memory, and their re-evaluation as a result of a critical and logical approach.[18]

The emergence of a traumatic experience devastates the most basic beliefs of the person, basic assumptions about the world, oneself, and others.[19] While individuals struggle with trauma (diagnosing cancer and receiving cancer treatment), they realize a cognitive, emotional, and behavioral transformation.[14] Traumas negatively affect an individual's assumptions and basic beliefs. It is stated that traumatic events negatively affect individuals' sense of bonding, meaning, control, and existing coping mechanisms and cause the person to experience extreme helplessness and horror.[20] At the point of giving meaning to the difficult event and making sense of the sensations, the individual's "assumptions about the world" come to the fore. World assumptions are defined as "a concept implicating the safety and well-being of the person."[21]

Individuals suffering from cancer are defined as a special group in need of nursing care.[22,23] In the relevant study, the cancer patients considered the nursery as a fundamental and valuable contribution to their well-being.[24] Nevertheless, it was also reported that nurses who constantly communicate with the patients focus on the increase of the nursery quality of the individuals who are diagnosed with cancer.[25] Consultation-liaison psychiatry (CLP) is one of the substantial approaches to psychosocial care. CLP nurse is a fundamental mental health professional who undertakes an active role in evaluating and managing both the mental and emotional problems caused by physical symptoms and the effective cognitive and perceptual processes in the emergence of these problems. Thus, this study aims to evaluate the traumatic cognitions that can lead to mental disorders in cancer cases and the assumptions of patients who can change with the disease process, about themselves, events, and the world.

### Study Questions

- What are the traumatic cognitions of cancer patients and their assumptions about the world?
- Is there a relationship between cancer patients' traumatic cognitions and their assumptions about the world?
- What are the factors that affect cancer patients' traumatic cognition and assumptions about the world?

## Materials and Methods

### Sample and Recruitment

This is a single-center, descriptive, and correlation-seeking study. The target population of the study consists of all patients hospitalized in Ankara University Faculty of Medicine Cebeci Application and Research Hospital Oncology and Hematology Departments. No sampling selection was made, and all cancer patients between the ages of 18 and 65 who consent to participate in the study and hospitalized in Ankara University Medical Faculty Cebeci Application and Research Hospital Oncology and Hematology departments between May 2016 and January 2017 were included in the study. The sample was selected by simple random sampling. The sample of the study was 249 patients. There is no data loss in this study.

*Post hoc* power analysis was performed to determine the adequacy of the sample size. In the power analysis made considering the correlation coefficient of 0.565 between the total scores of the scales, it was determined that the study with 95% confidence (1-α), 249 sample numbers had 100% test power (1-β). This result indicates that the sample is sufficient.

### Inclusion Criteria

Being between 18 and 65 years old, being diagnosed with cancer for at least 6 months, being inpatient, being

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literate, conscious patients, Turkish speaking patients, and patients without communication problems were included in the study.

**Exclusion Criteria**
Being younger than 18, older than 65, not being diagnosed with cancer, not receiving inpatient treatment, patients diagnosed by a psychiatrist, patients with autoimmune disease, patients receiving high-dose chemotherapy, and being illiterate were excluded from the study.

**Data Collection Procedure**
The data were collected using the "Personal Information Form," "Post-Traumatic Cognitions Scale (PTCS)," and "World Assumptions Scale (WAS)."

**Introductory Information Form:** It is a form consisting of ten questions about the sociodemographic and disease characteristics of the participants.

**PTCS**
This is a seven-point Likert scale consisting of 36 items and it has been developed to evaluate traumatic cognitions considered effective in the emergence and duration of PTSD. The score interval of the scale is between 36 and 252. Higher scores on the scale indicate an increase in negative cognitions about the traumatic experience.[26] It was adapted to Turkish by Yetkiner (2010).[27] The scale has three sub-scales: Negative cognitions about oneself, negative world cognitions, and self-reproach. Cronbach alpha reliability coefficient of PTCS was found 0.95 for the whole scale, 0.95 for the "negative cognitions about oneself" sub-scale, and 0.89 for the "negative cognitions about the world" sub-scale. In this study, the Cronbach alpha reliability coefficient of PTCS was found to be 0.96 for the whole scale, 0.95 for the "negative cognitions about oneself" sub-scale, 0.85 for the "negative cognitions about the world" sub-scale, and 0.82 for the "self-reproach" sub-scale.

**WAS**
The scale was developed by Janoff-Bulman (1989) in a seven-factor structure with 32 items to measure the basic assumptions about the world of individuals with and without traumatic life events. The internal consistency coefficients of the original form of the scale ranged from 0.66 to 0.76 for the sub-scales.[28] The scale was adapted to Turkish by Yılmaz (2008) and the number of items in the scale was decreased to 25, and the factor number was decreased to 6. This is a six-point Likert scale.[29] This scale has six sub-scales, namely, belief in personal fortune, belief in the goodness of the world, belief that events can be controlled in advance, belief that life is based on chance, positive self-belief, and belief that the world is fair. İtems 5, 13, and 24 are reverse coded in the Turkish version. The analysis result of the adaptation study stated that the Cronbach alpha reliability coefficient varied between 0.81 for the whole scale and 0.63–0.85 for the sub-scales.[29] In this study, the Cronbach alpha reliability coefficient of the scale ranged from 0.90 for the "total world assumptions" and between 0.58 and 0.85 for the relevant sub-dimensions.

**Ethical Approach**
The study was conducted in Ankara University Medical Faculty Cebeci Application and Research Hospital Oncology and Hematology Departments under the written consent obtained from Ankara University Faculty of Medicine Dean's Office (dated 16.02.2016, numbered 93984376-044/E.7794). Ethics committee approval was obtained from the Ordu University Ethics Committee (dated 01.04.2016, numbered 2016/18). The present study was explained to the participants and written consents of the participants were obtained from the individuals.

**Data Analysis**
The compliance of the data to normal distribution was tested with the Shapiro-Wilk test. Mann–Whitney U-test was used to compare abnormally distributed features in two independent groups, and the Kruskal-Wallis test and all pairwise multiple comparison tests were used for comparison of more than two independent groups. Correlation between numerical scales was tested with the Spearman correlation coefficient. Cronbach alpha coefficients were calculated to ensure validity and reliability. Mean±standard deviation for numerical scales, number, and % values for categorical scales was provided as descriptive statistics. A statistical package program was used for the statistical analysis and $p<0.05$ was considered statistically significant. There is no data loss in this study.

## Results

According to the results obtained, of the participants, 34% are 55–65 years old, 52% are male, 71% are married, 33% are high school graduates, and social security of 49% of the patients is SSK. Of the participants, 52% had not received any help for their mental problems before,

**Table 1** Distribution of descriptive characteristics of the participants

| | n | Min. | Max. | $\bar{x}$ | SD |
|---|---|---|---|---|---|
| Age | 249 | 18 | 65 | 46.03 | 13.15 |
| Year of diagnosis | 249 | 0.00 | 20 | 2732.49 | 1759.03 |
| Monthly Income | 249 | 300 | 15.000 | 2.63 | 3.42 |
| | **n** | **%** | | | |
| Sex | | | | | |
| Woman | 118 | 47.4 | | | |
| Male | 131 | 52.6 | | | |
| Marital status | | | | | |
| Never married | 39 | 15.7 | | | |
| The married | 179 | 71.9 | | | |
| Divorced/widow | 31 | 12.4 | | | |
| Educational status | | | | | |
| Literate/primary school | 68 | 27.3 | | | |
| Secondary school | 25 | 10.0 | | | |
| High school | 84 | 33.7 | | | |
| University and above | 72 | 28.9 | | | |
| Social security | | | | | |
| Pension fund | 68 | 27.3 | | | |
| Bagkur | 37 | 14.9 | | | |
| SSK | 122 | 49.0 | | | |
| General health insurance | 22 | 8.8 | | | |
| Age Groups | | | | | |
| 18-24 | 15 | 6.0 | | | |
| 25-34 | 39 | 15.7 | | | |
| 35-44 | 48 | 19.3 | | | |
| 45-54 | 62 | 24.9 | | | |
| 55-65 | 85 | 34.1 | | | |
| Diagnosis | | | | | |
| Lymphoma | 37 | 14.9 | | | |
| GIS cancers | 44 | 17.7 | | | |
| Breast+lung | 41 | 16.5 | | | |
| Other cancers | 18 | 7.2 | | | |
| Acute/chronic leukemia | 84 | 33.7 | | | |
| Multiple myelom | 25 | 10.0 | | | |
| Mental support status | | | | | |
| Yes | 116 | 46.6 | | | |
| No | 133 | 53.4 | | | |
| Stem cell transplant status | | | | | |
| Yes | 40 | 16.1 | | | |
| No | 209 | 83.9 | | | |
| Organ transplant status | | | | | |
| Yes | 9 | 3.6 | | | |
| No | 240 | 96.4 | | | |

33% were diagnosed with acute/chronic leukemia, 83% did not have a stem cell transplant, and 96% did not have an organ transplant. The average age of the participants is 46.03±13.15; the year of diagnosis is 2.63±3.42 years and varies between 0 and 20 years (Table 1).

The difference between the mean scores of the "self-blame" sub-scale of the PTCS was statistically significant in terms of age groups ($p<0.05$). A significant difference is found regarding the 45-54 age groups.

Table 2 shows the comparison of the mean scores of the post-traumatic cognitions sub-scale of the participants according to the distribution of disease characteristics. These data indicate that the difference between the total score of the PTCS and the mean scores of all

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**Table 2** Comparison of post-traumatic cognitions scale (PTCS) sub-dimension mean scores according to the distribution of disease characteristics of the participants (n=249)

| Disease characteristics | n<br>x̄ ±SD | Self-related negative cognitions<br>x̄ ±SD | Negative cognitions of the world<br>x̄ ±SD | Blame yourself<br>x̄ ±SD | PTCS total score |
|---|---|---|---|---|---|
| Diagnosis* | | | | | |
| Lymphoma[a] | 37 | 58.49±19.78 | 31.62±8.04 | 14.11±5.44 | 113.05±30.43 |
| Gis cancers[b] | 44 | 84.50±20.16 | 42.34±6.98 | 18.89±6.25 | 155.75±31.52 |
| Breast+lung[c] | 41 | 85.15±22.48 | 43.51±8.81 | 20.07±7.11 | 158.61±36.65 |
| Other cancers[d] | 18 | 74.72±18.16 | 41.67±6.8 | 19.06±4.19 | 145.28±26.44 |
| Acute/chronic leukemia[e] | 84 | 63.90±24.10 | 34.87±9.84 | 15.54±6.64 | 123.37±37.98 |
| Multiple myeloma[f] | 25 | 61.44±21.09 | 33.8±8.23 | 14.8±6.68 | 118.60±31.83 |
| | | KW: 46.362/p=0.001* | KW: 58.032/p=0.001* | KW: 25.713/ p=0.001* | KW: 52.985/ p=0.001* |
| Help for mental problems | | | | | |
| Yes | 116 | 76.80±23.52 | 39.41±9.26 | 18.24±6.84 | 144.19±37.34 |
| No | 133 | 65.51±23.60 | 35.86±9.68 | 15.62±6.28 | 126.11±37.36 |
| | | KW: -3.606/p=0.001* | KW: -2.830/p=0.005* | KW: -2.924/p=0.003* | KW:-3.604/p=0.001* |
| Year of diagnosis** | | | | | |
| <1 year[a] | 75 | 60.99±21.00 | 34.24±9.54 | 16.00±6.08 | 120.05±33.86 |
| 1-5 years[b] | 148 | 76.10±24.16 | 39.52±9.03 | 17.05±6.83 | 142.35±38.24 |
| 6 years and above[c] | 26 | 68.65±24.54 | 35.54±10.53 | 18.12±7.27 | 131.77±40.05 |
| | | KW: 18.405/p=0.001* | KW: 16.132/p=0.001* | KW: 1.637/p=0.441 | KW: 14.869/p=0.001* |
| Stem cell transplant status | | | | | |
| Yes | 40 | 62.48±21.49 | 32.55±9.51 | 15.4±6.83 | 119.53±35.24 |
| No | 209 | 72.36±24.39 | 38.49±9.38 | 17.12±6.62 | 137.40±38.34 |
| | | U: -2.436/p=0.15 | U: -3.555/p=0.001* | KW: -1.362/p=0.173 | KW: -2.732/p=0.006* |
| Organ transplant status | | | | | |
| Yes | 9 | 88.56±15.68 | 43.67±6.42 | 20.44±6.69 | 162.44±28.07 |
| No | 240 | 70.10±24.21 | 37.28±9.66 | 16.71±6.64 | 133.48±38.34 |
| | | U: -2.322/p=0.020* | U: -1.965/p=0.049* | U: -1.305/p=0.192 | U: -2.218/p=0.027* |

*: Significant difference is "a" and "d," "a" and "b," "a" and "c," "f" and "d," "f" and "b," and "f" for diagnosis in PTCS and "c" is between "e" and "d," "e" and "b," and "e" and "c"; **: Significant difference is between "a" and "b" for the year of diagnosis.

sub-scales is statistically significant in terms of the participant diagnoses ($p<0.05$). It was determined that the disease group with the highest mean total score on the PTCS was breast-lung cancer, and the lowest was lymphoma. In terms of getting help for mental problems, both the PTCS total score average and the difference between the mean scores of all sub-scales are statistically significant ($p<0.05$). PTCS total score averages of the patient group who received help for their mental problems were determined to be higher.

In terms of years of diagnosis, the difference between the total score of the PTCS and its sub-scales "negative cognitions about oneself" and "negative cognitions about the world" is statistically significant ($p<0.05$). The significant difference is due to the group, whose year of diagnosis is between 1 and 5 years. In terms of receiving stem cell transplants, the difference between the mean total score of the PTCS and the "negative cognitions about the world" scale mean score is statistically significant ($p<0.05$). It was determined that the significant difference was caused by the group without stem cell transplantation.

In terms of having organ transplants, the PTCS total score mean and the difference between "negative cognitions about oneself" and "negative cognitions about the world" sub-scale mean scores are statistically significant ($p<0.05$). It was determined that the significant difference was caused by the group having organ transplantation.

Table 3 shows the comparison of the WAS total score and sub-scale mean scores according to the descriptive characteristics of the participants. Accordingly, in terms of the gender of the participants, the "belief that events can be controlled in advance" scale mean scores was

**Table 3** Comparison of the world asumptions scale (WAS) sub-dimension mean scores according to the descriptive characteristics of the participants (n=249)

| Sociodemographic characteristics | n | Belief in personal fortune x̄±SD | Belief in the good of the world x̄±SD | Belief that events can be pre-controlled x̄±SD | The belief that life is based on on coincidences x̄±SD | Positive self belief x̄±SD | The belief that the world is fair x̄±SD | World assumptions scale total x̄±SD |
|---|---|---|---|---|---|---|---|---|
| Sex | | | | | | | | |
| Women | 118 | 11.82±5.54 | 15.97±6.49 | 19.58±4.35 | 12.95±4.25 | 17.36±2.94 | 8.96±3.46 | 86.63±16.9 |
| Men | 131 | 12.75±5.34 | 16.31±6.14 | 20.76±4.28 | 12.11±4.29 | 17.5±3.54 | 9.73±3.74 | 89.15±16.77 |
| | | U:-1.348 | U:-0.387 | U:-2.637 | U: -1.746 | U: -1.101 | U: -1.644 | U: -1.402 |
| | | p=0.178 | p=0.699 | p=0.008* | p=0.081 | p=0.271 | p=0.100 | p=0.161 |
| Marital status* | | | | | | | | |
| Never married[a] | 39 | 11.82±5.42 | 14.15±6.31 | 18.21±4.81 | 11.23±4.25 | 17.03±4.04 | 8.9±3.42 | 81.33±16.23 |
| The married[b] | 179 | 12.61±5.53 | 16.78±6.25 | 20.36±4.23 | 12.70±4.27 | 17.45±3.15 | 9.63±3.62 | 89.53±17.03 |
| Divorced/widow[c] | 31 | 11.19±4.92 | 15.00±6.07 | 21.77±3.52 | 13.03±4.19 | 17.81±2.83 | 8.42±3.8 | 87.23±14.86 |
| | | KW: 1.906 | KW: 6.341 | KW: 10.082 | KW: 3.825 | KW: 0.573 | KW: 3.427 | KW: 8.350 |
| | | p=0.385 | p=0.042* | p=0.006* | p=0.148 | p=0.751 | p=0.180 | p=0.015* |
| Educational status** | | | | | | | | |
| Literate/primary school[a] | 68 | 12.84±5.9 | 18.24±5.9 | 20.65±4.73 | 13.26±3.99 | 17.68±2.73 | 10.82±3.58 | 93.49±16.46 |
| Secondary school[b] | 25 | 11.2±5.22 | 15.56±7.41 | 19.28±3.74 | 11.64±4.54 | 17.44±3.71 | 9.4±3.95 | 84.52±18.42 |
| High school[c] | 84 | 11.88±5.34 | 14.76±6.00 | 20.40±3.95 | 12.19±4.03 | 16.92±3.57 | 8.61±3.38 | 84.76±16.02 |
| University and above[d] | 72 | 12.69±5.37 | 15.99±6.21 | 19.86±4.6 | 12.47±4.71 | 17.79±3.18 | 8.85±3.49 | 87.65±16.60 |
| | | KW: 2.148 | KW: 11.897 | KW: 3.897 | KW: 4.491 | KW: 2.580 | KW: 15.089 | KW: 10.967 |
| | | p=0.542 | p=0.008* | p=0.273 | p=0.213 | p=0.461 | p=0.002* | p=0.012* |
| Socail security*** | | | | | | | | |
| Pension find[a] | 68 | 12.32±5.22 | 15.1±5.77 | 20.4±4.15 | 12.87±4.97 | 17.31±3.23 | 8.76±3.47 | 86.76±15.95 |
| Bağkur[b] | 37 | 12.49±5.51 | 15.57±6.5 | 20.27±3.9 | 12.51±3.49 | 17.22±2.96 | 9.68±3.87 | 87.73±15.41 |
| SSK[c] | 122 | 12.35±5.48 | 17.02±6.49 | 20.22±4.48 | 12.67±4.05 | 17.47±3.39 | 9.93±3.54 | 89.66±17.83 |
| General health insurance[d] | 22 | 11.73±6.1 | 15.5±6.19 | 19.36±5.0 | 10.5±4.19 | 17.95±3.27 | 7.55±3.46 | 82.59±15.8 |
| | | KW:11.73 | KW: 5.124 | KW: 0.725 | KW: 5.256 | KW: 1.067 | KW: 10.031 | KW: 3.510 |
| | | p=0.850 | p=0.163 | p=0.867 | p=0.154 | p=0.785 | p=0.018* | p=0.319 |

*: Significant difference is between "a" and "b" for WAS marital status; **: Significant difference is between "b" and "a," and "c" and "a" for WAS educational status; ***: Significant difference is between "d" and "b," and "d" and "c" for the scale of assumptions about the world

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found to be statistically significant (p<0.05). In terms of the marital status of the participants, the difference between the scale means score of "world assumptions," "belief in the goodness of the world," and "belief that events can be controlled in advance" is statistically significant (p<0.05). In terms of the social security of the participants, only the "belief that the world is fair" scale of the scale of world assumptions showed a statistically significant difference (p<0.05).

Table 4 shows the comparison of the total mean scores of the WAS and the mean scores of its sub-scales according to the distribution of the disease characteristics of the participants. According to these data, the total mean scores of the WAS, "belief in personal fortune," "belief in the goodness of the world," and "belief that the world is fair" in terms of the diagnoses of the participants, showed a statistically significant difference (p<0.05). The significant difference is due to the group, whose year of diagnosis is between 1 and 5 years. The disease group with the lowest total means score on the scale is lung-breast cancer, while the disease group with the highest total mean score is multiple myeloma (MM).

In terms of getting help for the mental problems of the participants, scale mean scores of "belief in the goodness of the world" and "positive self-belief" showed a statistically significant difference (p<0.05). The total score averages of the WAS of the patient group who received help for their mental problems were found to be lower. In terms of the participants having organ transplants, the mean score of the "positive self-belief" scale showed a statistically significant difference (p<0.05). The mean scale scores of those who had organ transplants were found to be lower.

According to Table 5, a moderate negative correlation between the total score of the WAS and the total score of the PTCS, negative cognitions about oneself, and the negative cognition about the world sub-scale in the negative direction was determined, and a weak correlation with the self-blame sub-scale was detected (p<0.05). In terms of the PTCS total score of belief in personal fortune sub-scale, a moderate negative correlation was found between negative cognitions about oneself and negative cognitions about the world, and a weak correlation with the self-blame sub-dimension (p<0.05). Post-traumatic cognitions total score of the positive self--belief sub-scale and negative cognitions about oneself were moderately significant negatively; negative cognitions about the world sub-scale and self-blame sub-scale were negatively weakly correlated (p<0.05).

Table 5 shows the total mean scores of the PTCS and the WAS. According to these data, the participants obtained 134.53±38.36 total points from the PTCS; they obtained 70.77±24.18 points from the "negative cognitions about oneself" sub-scale, 37.51±9.63 from the "negative cognitions about the world" sub-scale, and 16.84±6.67 from the "self-blame" sub-scale. For the WAS, participants received 87.95±16.84 points as a total score; they got 12.30±5.44 from the "belief in personal fortune" sub-scale, 16.14±6.29 from the "belief in the goodness of the world" sub-scale, 20.20±4.34 from the "belief that events can be controlled in advance" sub-scale, 12.51±4.28 from the "belief that life is based on chance" sub-scale, 17.42±3.26 from the "belief in positive memory" sub-scale, and 9.36±3.62 from the "belief that the world is fair" sub-scale.

## Discussion

Mental health issues are common in cancer patients, with a frequency varying between 30% and 60% [5-6] When the meaning attributed to cancer by the individual interacts with the meaning, he/she attributed to the world, events, his/her self (world assumptions), and negative cognitions (being traumatic); these mental health issues can worsen and can become chronic.

The mean PTCS total score in this study was found to be 134.53±38.36, "negative cognitions about oneself" at 70.77±24.18, "negative cognition about the world" at 37.51 ± 9.63, and "self-blame" at 16.84±6.67. In a study conducted with individuals with various traumatic experiences, including cancer patients; for the PTCS, the mean score was 121.05±40.45, "negative cognitions about oneself" was 3.51±1.29, "negative cognitions about the world" scale mean score was 4.84±1.26, and "self-blame" scale mean score was 2.70±1.90.[30] According to a study conducted with women who were subjected to partner abuse and endured traumatic experiences, the mean score of the "self-blame" scale was found to be 18.75±7.75, and the mean score of "negative cognition of oneself" was found to be 72.66±29.61. [31] According to a study carried out with veterans who were experienced military trauma, the PTCS total score was 129.2±41.8.[32] In a study of stillbirth women, the mean score of "negative cognitions about oneself" was 64.12±31.44, the mean score of the "self-blame" scale was 14.60±7.33, and the mean score of "negative cognitions about the world" was 22.74±11.17.[33] Studies in the literature and the results obtained from this study indicate that cancer patients have higher mean scores in terms of traumatic cognitions and sub-scales compared to individuals with other traumatic experiences. The difference is considered to be because the experi-

**Table 4** Comparison of the sub-dimension mean scores of the world assumptions scale (WAS) according to the distribution of the disease characteristics of the participants (n=249)

| Disease characteristics | n | Belief in personal fortune x̄±SD | Belief in the good of the world x̄±SD | Belief that events can be pre-controlled x̄±SD | The belief that life is based on coincidences x̄±SD | Positive self-belief x̄±SD | The belief that the world is fair x̄±SD | World asumptions scale total x̄±SD |
|---|---|---|---|---|---|---|---|---|
| Diagnosis* | | | | | | | | |
| Lymphoma[a] | 37 | 13.32±5.99 | 17.59±6.05 | 19.38±4.66 | 12.43±3.94 | 17.7±3.89 | 10.08±3.58 | 90.51±17.81 |
| Gis cancers[b] | 44 | 10.25±4.1 | 13.25±5.01 | 21.05±2.85 | 12.18±3.87 | 16.84±3.09 | 8.91±3.52 | 82.48±15.09 |
| Breast+lung[c] | 41 | 10.07±4.49 | 12.46±5.77 | 20.29±3.96 | 12.32±4.33 | 16.78±2.57 | 7.68±3.09 | 79.61±12.32 |
| Other cancers[d] | 18 | 10.83±4.78 | 13.89±4.71 | 21.61±3.52 | 13.11±4.98 | 16.33±3.31 | 8.61±3.01 | 84.39±11.01 |
| Acute/chronic leukemia[e] | 84 | 13.54±5.7 | 18.58±6.47 | 19.33±4.98 | 12.89±4.5 | 18.05±3.25 | 9.88±3.78 | 92.27±18.12 |
| Multiple myeloma[f] | 25 | 15.04±5.24 | 18.56±4.67 | 21.68±4.27 | 11.8±4.34 | 17.84±3.3 | 10.64±3.68 | 95.56±16 |
| | | KW: 25.365 | KW: 43.580 | KW: 8.432 | KW: 1.769 | KW: 10.676 | KW: 16.860 | KW: 28.666 |
| | | p= 0.001* | p=0.001* | p=0.134 | p=0.880 | p=0.058 | p=0.005* | p=0.001* |
| Help for mental problems | | | | | | | | |
| Yes | 116 | 11.86±5.64 | 15.04±6.32 | 20.16±4.28 | 12.84±4.69 | 16.88±3.5 | 9.00±3.7 | 85.78±16.54 |
| No | 3 | 12.7±5.26 | 17.11±6.14 | 20.23±4.41 | 12.23±3.89 | 17.91±2.98 | 9.89±3.54 | 89.85±16.95 |
| | | U: -1.416 | U: -2.559 | U: -0.465 | U: -0.826 | U: -2.649 | U: -1.460 | U: -1.918 |
| | | p=0.157 | p=0.010* | p=0.642 | p=0.409 | p=0.008* | p=0.144 | p=0.055 |
| Year of diagnosis** | | | | | | | | |
| <1 year[a] | 75 | 14.43±5.72 | 18.75±5.83 | 20.87±4.27 | 12.57±4.73 | 18.01±2.98 | 10.24±3.61 | 94.87±16.93 |
| 1-5 years[b] | 148 | 11.19±5.01 | 14.74±5.99 | 20.15±4.14 | 12.24±4.07 | 17.03±3.27 | 9.00±3.65 | 84.61±15.43 |
| 6 years and above[c] | 26 | 12.58±5.37 | 16.65±7.07 | 18.58±5.3 | 13.88±3.98 | 16.46±3.78 | 8.88±3.2 | 87.04±18.89 |
| | | KW: 14.847 | KW: 19.997 | KW: 3.806 | KW: 4.291 | KW: 4.231 | KW: 6.707 | KW: 18.140 |
| | | p=0.001* | p=0.000 | p=0.149 | p= 0.117 | p=0.121 | p=0.035* | p=0.001* |
| Stem cell transplant status | | | | | | | | |
| Yes | 40 | 13.38±6.16 | 17.35±6.38 | 19.23±5.64 | 11.43±4.85 | 18.18±3.47 | 9.38±4.16 | 88.93±21.51 |
| No | 209 | 12.11±5.29 | 15.91±6.27 | 20.39±4.04 | 12.72±4.14 | 17.29±3.21 | 9.36±3.52 | 87.77±15.89 |
| | | U: -1.276 | U: -1291 | U: -0.833 | U: -1.346 | U: -1.658 | U: -0.111 | U: -0.505 |
| | | p=0.202 | p= 0.197 | p=0.405 | p=0.178 | p=0.097 | p=0.912 | p=0.614 |
| Organ transplant status | | | | | | | | |
| Yes | 9 | 8.89±2.15 | 13.33±3.46 | 21.22±3.99 | 14.44±4.33 | 15.11±2.93 | 8.11±2.8 | 81.11±7.18 |
| No | 240 | 12.44±5.49 | 16.25±6.36 | 20.16±4.36 | 12.44±4.27 | 17.52±3.25 | 9.41±3.65 | 88.21±17.06 |
| | | U: -1.736 | U: -1.362 | U: -0.364 | U: -1.236 | U: -2.126 | U: -1.060 | U: -1.228 |
| | | p=0.083 | p=0.173 | p=0.716 | p=0.216 | p= 0.033* | p=0.289 | p=0.219 |

*: Significant difference is between "c" and "e", "c" and "f", "b" and "e", "b" and "f" for WAS diagnostic groups; **: Significant difference is between "b" and "a" for the year of diagnosis of WAS

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**Table 5** Relationship between post-traumatic cognitions scale (PTCS), world assumptions scale (WAS), and sub-dimension mean scores

| Sub-dimensions of scales | Post-traumatic cognition scale total score | Self-related negative cognitions sub-scale | Negative cognitions of the world sub-scale | Self blame sub-scale | Mean±SD |
|---|---|---|---|---|---|
| World assumptions scale total score | | | | | |
| r | -0.565** | -0.562** | -0.510** | -0.358** | 87.95±16.84 |
| p | 0.001 | 0.001 | 0.001 | 0.001 | |
| Belief in personal fortune | | | | | |
| r | -0.538** | -0.528** | -0.479** | -0.386** | 12.30±5.44 |
| p | 0.001 | 0.001 | 0.001 | 0.001 | |
| Belief in the good of the world | | | | | |
| r | -0.643** | -0.622** | -0.639** | -0.389** | 16.14±6.29 |
| p | 0.001 | 0.000 | 0.001 | 0.001 | |
| Belief that events can be pre-controlled | | | | | |
| r | -0.067 | -0.102 | 0.036 | 0.012 | 20.20±4.34 |
| p | 0.293 | 0.109 | 0.572 | 0.851 | |
| Belief that life is based on coincidences | | | | | |
| r | 0.039 | 0.044 | 0.054 | -0.028 | 12.51±4.28 |
| p | 0.538 | 0.493 | 0.395 | 0.665 | |
| Positive self-belief | | | | | |
| r | -0.485** | -0.499** | -0.382** | -0.329** | 17.42±3.26 |
| p | 0.001 | 0.001 | 0.001 | 0.001 | |
| Belief that the world is fair | | | | | |
| r | -0.204** | -0.202** | -0.247** | -0.091 | 9.36±3.62 |
| p | 0.001 | 0.001 | 0.001 | 0.151 | |
| Mean±SD | 134.53±38.36 | 70.77±24.18 | 37.51±9.63 | 16.84±6.67 | |

**: P<0.001

ence of suffering from cancer may involve more than one trauma during the diagnosis and treatment process, some of which are complex and repetitive, and cancer is perceived as an "internal" threat rather than external risks resulting from attacks and natural disasters.[34,35] The uncertainty, fear of potential mortality in the future, and the risk of cancer recurrence or metastasis may lead the individual diagnosed with cancer to experience constant fear, anxiety, and panic.[36-38] Thus, cancer trauma differs from other types of trauma, and it is thought that this circumstance may be the reason why individuals diagnosed with cancer experience more negative cognitions. Sheerin et al. (2018)[39] found that the mean score of "negative cognitions about oneself" was 42.84±19.74, the mean score of "self-blame" was 9.4±5, and the mean score of "one's negative cognitions about the world" was 29.33±9.17 in his study with victims of war trauma. Chung and Reed (2017)[33] found that the mean score on the "negative cognitions about oneself" scale was 64.12±31.44, the mean score on the "self-blame" scale was 14.60±7.33, and the mean score on the "negative cognitions of the person about the world" scale was 14.60±7.33. When the mean scores of the scales from both types of research are compared, it is clear that the people in our study have more negative thoughts. This disparity is thought to be because the cancer experience may include multiple traumas during the diagnosis and treatment process, some of which are complex and repetitive, and that cancer is perceived as an "internal" threat in contrast to external threats such as terrorist attacks and natural disasters.[34,35] Furthermore, due to the uncertainty of the illness's future, the potential fear of death, and the chance of recurrence or metastasis, an individual diagnosed with cancer may experience persistent worry, anxiety, and panic.[36-38]

In this study, the year of diagnosis was found to have a statistically significant difference in, both post-traumatic cognitions total score and "negative cognitions about oneself" and "negative cognitions about the world" sub-scale mean scores ($p<0.05$). In a study

with lung cancer patients, a higher rate of depression was discovered during the first 0-5 years.[40] In another study on the subject, the duration of exposure to traumatic experience was found to be statistically insignificant (p>0.05).[30] In this study, it is thought that the reason for the significant difference appearing within 1–5 years is the diagnosis of cancer and the difficulties of adjusting to the process in the early years.

In this study, patients with organ transplants had a higher total score on the PTCS, and patients with stem cell transplants had greater world assumptions than those who had not undergone any transplant surgery. In a study of stem cell transplant patients, it was discovered that the rates of sadness (43.3%) and PTSD (28.4%) increased in the first six months. These data suggest that stem cell and organ transplantation have a deleterious impact on cognition, perception, and mental health.[41]

The overall score of the participants on the PTCS, as well as the mean scores of all sub-scales, was found to be statistically significant (p<0.05) for all diagnoses in this study. Lung-breast cancer was the diagnosis group with the most unfavorable cognition. In this study, the "belief in the goodness of the world" sub-scale was 16.14±6.29, the "belief in the world is fair" sub-scale was 9±3.62, the "belief in the ability to control events in advance" sub-scale was 20. 20±4.34, the "belief in personal fortune" sub-scale was 12.30±5.44, "belief in life is based on chance" sub-scale was 12.51±4.28, "positive self-belief" was 17.42±3.26, and WAS total score was 87.95±6.84. A statistically significant difference was found between the diagnoses of the participants and the mean scores of the PTCS total, all sub-scales of PTCS, and the sub-scales of WAS regarding belief in personal luck, belief in the goodness of the world, and belief that the world is fair (p<0.05). In a study conducted with patients diagnosed with cancer, the "belief in the goodness of the world" sub-scale was 19.1±4.1, the "belief in the fairness of the world" sub-scale was 11.2±4.7, the "belief that events could be controlled in advance" sub-scale was 12.9±4.1, the "belief in personal fortune" sub-scale was 18.0±4.7, the "belief that life-based on chance" sub-scale was 15.1±4.4, and "optimistic self-belief" was 21.3±3.8 points.[42] In relation to the subject, the study of Yom Kippur conducted on prisoners of war yielded the world assumption scale total score of 118.36±17.03. A difference was found between the diagnosis groups according to the WAS total score, "benevolence of the world," "meaningfulness of the world," and "self-worth sub-dimension" scores (p<0.01).[43] In their study with war victims, "belief in the goodness of the world" was 24.12±3.85, "belief in the fairness of the world" was 23.6±8.48, "belief that events can be controlled in advance" was 10.92±3.15, "belief in personal fortune" was 16.28±3.58, "belief that life is based on chance" was 22.62±5.16, and "positive self-belief" was 19.56±3.4 points.[44] These studies show that being a cancer patient has a significant negative impact on one's assumptions about the world. In the literature, it is stated about the issue that it may be related to the fact that cancer is inherently a life-threatening disease suggesting the consciousness of death; the experience of suffering from cancer also entails that there is uncertainty about prognosis, optimal treatment, the likelihood of nonresponse to treatment, and possible future effects; and it is stated that it may be correlated to the progression of the disease and the constant presence of fear of relapse.[37,45]

The overall score of the participants on the PTCS, as well as the mean score of all sub-dimensions, was statistically significant for all diagnoses (p<0.05) in this study. Lung-breast cancer received the maximum negative cognition score of 158.61±36.65 points; while lymphoma received the lowest score of 113.05±30.43 points. El-Jawahri et al. (2015)[41] found that using cognitive behavioral therapy techniques to patients during their hospitalization helped lessen sadness and PTSD symptoms within 6 months after transplantation in their study with cancer patients who got stem cell transplantation. Both investigations show that they are related.

The belief level of men (x±SD: 20.7±64.28) that events can be controlled ahead of time was found to be significantly greater than that of women (x±SD: 19.58±4.35) in this study, with a statistical difference (p<0.05). According to Erkmen's (2017) research with trauma victims, men's "belief in the goodness of the world" is significantly higher than women's, men's belief in the controllability of events is significantly higher than women's, and men's belief in the fairness of the world is significantly higher than women's (p<0.05).[46] Tüfekçi (2011) found that males have considerably greater levels of belief in the goodness of the world, belief in the fairness of the world, belief in personal luck, and believe in control than females in his study of people who had a traffic accident regarding the world. It can be seen that the substantial difference in favor of men found in this study between world assumptions and gender is consistent with the findings of other investigations.[47] This assessment also highlights the fact that the interaction between worldview beliefs, which have been shown to play a role in mental health,

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and the structural factors that contribute to inequity in gender roles and women's powerlessness, is a different issue that needs to be addressed.

Post-traumatic cognitions of organ transplant participants had a mean total score of 162.44±28.07 for those who had the transplant, 133.48±38.34 for those who did not, 88.561±5.68 for those who had "negative cognitions about oneself," and 70.10±24.21 for those who did not have a "negative cognition about the world" in this study. Those with "cognition" scored 43.67±6.42, while those without scored 37.28±9.66. Those who had their organs transplanted scored higher than those who did not. According to Dew et al. (2015),[48] sadness increases the chance of organ transplant rejection. In this regard, the findings of this and previous investigations are similar.

In the present study, a moderate negative correlation was found between the WAS and the PTCS, "negative cognitions about oneself" and "negative cognitions about the world," and a weak correlation with "self-blame" ($p<0.05$). A weak negative correlation with the PTCS, "negative cognitions about oneself" and "negative cognitions about the world" with belief in the fairness of the world, and a very weak negative correlation with "self-blame" was found in a study of people who had been through various traumas, including cancer patients ($p<0.05$).[26]

The outcomes of this study are likely to broaden the role of mental health nurses in cancer patients' psychosocial care and contribute to an improvement in cancer patients' quality of life and psychosocial adjustment to the condition.

## Conclusions

In the present study, it was determined that the traumatic cognition and world assumptions of the individuals diagnosed with cancer were negatively affected, especially in the 1st years of diagnosis. For this reason, actions such as mental assessment, counseling, and psychosocial support should be initiated as of the moment of informing patients in centers providing care for cancer patients. It can also be seen that it is important to carry out the disease and treatment process in co-operation with CLP.

As more than half of the participants (52%) did not receive any help for their mental problems, the traumatic cognition of the individuals who received help was higher and their world assumptions were negative. It is important to provide psychological support to cancer diagnosed patient groups in a long-term, planned, and structured way by including traumatic cognitions and world assumptions.

The data that support the findings of this study are available from the corresponding author upon request and will be provided if the manuscript is accepted for publication.

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