Somatic distress, mental health and psychological resilience among cancer patients during the pandemic

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Abstract

We aimed to investigate the somatic distress and psychological symptoms levels of cancer patients, and analyze the influencing factors on somatic distress during COVID-19 pandemic. This cross-sectional study included 216 eligible cancer patients. The Patient Health Questionnaire-15, Posttraumatic Stress Disorder (PTSD) Checklist for DSM-5, The Depression, Anxiety and Stress Scale-21, the Brief Resilience Scale, the Stressful Life Events List due to Pandemic were administered to the participants. The moderate to severe somatic distress rate was % 38 and probable PTSD rate was 20.4%. Depression, anxiety and stress symptoms were 36.1%, 49.1% and 45.4%, respectively, from mild to extremely severe. There were substantial association between somatic symptoms severity and high PTSD, anxiety, depression, and stress symptoms levels. Low education, high anxiety levels, high experience stressful life events, and low psychological resilience predicted high somatic distress. This study demonstrates the high risk of somatic distress, PTSD, depression, anxiety and stress in patients with cancer during the pandemic. In addition, somatic distress may indicate high levels of psychological symptoms, high experience stressful life events, and low psychological resilience. It underscores the need to assess psychological status during the pandemic, especially those with high level somatic symptoms.

Keywords: COVID-19, Cancer, Somatic Distress, Post-traumatic Stress, Depression.

Introduction

Corona Virus Disease 2019 (COVID-19) has been detected for the first time in December 2019 in Wuhan, China as a novel pneumonia causing respiratory tract infection (Wang et al., 2020). COVID-19, indicating person-to-person transmission and an asymptomatic course has rapidly spreaded out to the whole world (Chan et al., 2020). Most people infected with the Covid-19 virus have been experienced mild to moderate respiratory syndrome and have been recovered without special treatment. Developing serious consequences is a greater risk for the elderly, those with underlying medical conditions such as cardiovascular diseases, diabetes, chronic respiratory issues, and cancer (Wu & Mc Googan, 2020; Yang et al., 2020). The COVID-19 pandemic has created an unprecedented change in the lives of people worldwide, especially in patients with chronic diseases. Those with cancer may be particularly vulnerable to more severe disease due to their immunocompromised status from the underlying malignancy itself, as well as decreased immunity from cancer-directed treatments, additional medical comorbidities, and poor nutritional status (Gonzalez et al., 2020).

A few recent studies that evaluated psychological symptoms in oncology patients during the COVID-19 pandemic (Juanjuan et al., 2020; Wang et al., 2020; Romito et al., 2020; Miaskowski et al., 2020). Occurrence rates for depression and anxiety ranged from 9.3% to 31.0% and from 8.9% to 36.0%, respectively (Juanjuan et

al., 2020; Wang et al., 2020; Romito et al., 2020). In a study conducted on 187 oncology patients have been reported, rate of with probable post-traumatic stress disorder (PTSD) 31.6% (Miaskowski et al., 2020). But, Somatic distress has not been investigated yet in cancer patients during the pandemic. Somatic distress presentation in cancer is a complex area because of the overlapping of physical disease and treatment-related mechanisms and possible psychosocial mechanisms, and it is that needs investigation (Grassi L, Caruso R & Nanni MG, 2013) Previous studies have shown that heightened distress levels can lead to adverse outcomes in cancer patients including decreased satisfaction with care and noncompliance with treatment, low survival rates, desire to accelerate death, and poor quality of life for both patients and their relatives (Breitbart et al., 2000; Anuk et al., 2019).

Looking at the new, unrecognized and early unpredictable and uncontrollable pandemic process, it may be much more intense than the stress factors in daily life, it creates a common threat perception, there is a lack of information about the process, it includes social isolation and quarantine processes, in addition to the fact that there is uncertainty about the future, social and economic effects are evident, it is observed that it is distinguished by the fact that it creates a massive stress all over the world (Eser, 2020). It can be thought that the special population such as cancer patients will be affected more by this mass stress and its effect on them may cause more severe consequences. Therefore, it will be of great importance to define the psychological symptoms that may occur in cancer patients during the pandemic. For these reasons, this study aimed to a) estimate the levels of somatic, PTSD, depression, anxiety, and stress symptoms and b) investigate the relationship between somatic distress and demographic characteristics, psychological symptoms, stressful life events, and psychological resilience among the cancer patients during the pandemic. In this way, we aimed to shed light on the measures to be taken to prevent somatic distress and worse mental problems of cancer patients during the pandemic.

Method

Sample and Procedure

This cross-sectional study was conducted in XXX XXXXXX, between 15 June and 15 October 2020. This study included consecutively selected 216 eligible cancer patients, who receiving treatment or visiting the oncology center for routine follow-up examinations. To be eligible for study participation, patients had to be (a) diagnosed with any cancer type, (b) aged between 18 and 75 years, (c) able to complete questionnaire in Turkish language, and (d) able to provide informed consent. Reasons for exclusion were pregnancy, illiteracy, substance abuse, declared inability to complete questionnaires, serious psychiatric disorders that hindered judgement, and patients with any issues interfering with giving informed consent. The aim of the study was explained to the participants and invited to voluntarily participate, and informed consent forms were obtained before they were included in the study. This research was approved by the XXX XXXXXX ethical committee (reference 2020.06.1.11.082) and was conducted in accordance with the Declaration of Helsinki. The study protocol was also approved by the Turkish Ministry of Health, General Directorate of Health Services (reference ES-2020-05-07T13_40_22). The Patient Health Questionnaire-15 (PHQ-15), Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5), The Depression, Anxiety and Stress Scale-21(DASS-21), the Brief Resilience Scale (BRS), the Stressful Life Events List due to Pandemic and, demographic and clinical characteristics were administered to the participants with face to face interweaving by author AE who senior social worker trained for the study.

Measures

Demographic and clinical characteristics form.

Age, gender, marital status, education, employment status, economic well-being, comorbidity (hypertension, diabetes, coronary heart disease, chronic obstructive lung disease, chronic kidney disease, and other), and history of psychiatric disorders were assessed via self-report. Clinical characteristics included type of cancer, time since diagnosis, types of treatment currently or previously received, present treatment, and metastasis; this information was obtained from participants' medical charts.

Stressful Events List due to Pandemic.

The scale was prepared by authors, using the Stressful Life Events Screening Questionnaire (Wolfe et al., 1996) and review of the literature, and used to measure the stressful life event burden during the pandemic. The scale, answers are 0-no, 1-yes consisting of 18 questions and total scores ranging from 0 to 18. Higher scores on the scale are associated with stressful event burden. Cronbach's alpha internal consistency coefficient was determined as 0.73. A positive and significant relationship was found between the total score of the scale and depression (r = .35), anxiety (r = .32), stress (r = .32), PCL-5 total score (r = .41), and PHQ-15 total score (r = .38) (see Supplementary Table 1).

Patient Health Questionnaire (PHQ-15)

Somatic symptoms were measured using the PHQ-15 scale, which includes the 15 most common somatic symptoms. This scale assesses how much participants were bothered by health symptoms such as "abdominal pain", "back pain" on a scale of 0=not bothered at all to 2=bothered a lot. A total somatic symptom score was calculated, with possible scores ranging from 0 to 30, and scores scaled to account for the additional item asked only of female participants relating to menstrual pain and problems. Higher scores on the PHQ-15 are strongly associated with somatic symptoms. Somatic symptom severity were calculated in four categories based on the PHQ-15 score 'minimal' (0–4), 'mild' (5–9), 'moderate' (10–14), or 'severe' (≥15)(Kroenke, Spitzer & Williams, 2002). The Turkish validity-reliability study was conducted by Yazıcı Güleç et al. (2012) (Yazıcı et al., 2012). In this study, Cronbach's alpha of the PHQ-15 was 0.86.

Post-traumatic stress disorder checklist for DSM–5 (PCL-5)

The PCL-5 is a 20-item measure that assesses PTSD symptomatology: intrusions, avoidance, negative alterations in cognitions and mood (NACM), and hyperarousal. Participants responded to the items on 5-point Likert-type scales (0 = not at all to 4 = extremely) in relation to their experience of COVID-19 outbreak, with total scores ranging from 0 to 80 (Weathers et al., 2013). The Turkish version of PCL-5 was used, which has been shown to be reliable and valid. In this study, used ≥47 as a cut-off point to diagnose possible PTSD (Boysan et al., 2017). Among the current sample, the PCL-5 and subscales evidenced a Cronbach's alpha of α=.96 for PCL-5, α=.89 for intrusions, α=.87 for avoidance, α=.91 for NACM, and α=.92 for hyperarousal.

The Depression Anxiety Stress Scales-21 (DASS-21)

DASS-21 is a 21-item, self-report questionnaire designed to measure the severity of a range of depression, anxiety and stress symptoms. Each item of the DASS corresponds to one of the three subscales (depression, anxiety, and stress) with 7 items per subscale. The scale is a 4-point Likert from 0 (never) to 3 (almost always) and evaluates symptoms from last week (Lovibond & Lovibond SH, 1995; Akin A & Cetin B, 2007). DASS-21 raw scores were doubled for comparability to full-length (42 items) DASS scores. The depression score results were classified as normal (0-9), mild (10-12), moderate (13-20), severe (21-27), and extremely severe (28-42). The anxiety score results are classified as normal (0-6), mild (7-9), moderate (10-14), severe (15-19), and extreme severe (20-42). The stress score results were classified as normal (0-10), mild (11-18), moderate (19-26), severe (27-34), and extreme severe (35-42)[21]. Among the current sample, the DASS-21and subscales evidenced a Cronbach's alpha of α=.93 for DASS-21, α=.86 for depression, α=.78 for anxiety and α=.83 for stress.

Brief Resilience Scale (BRS)

The BRS includes six items. The respondents were asked to indicate how well each statement described their behaviour and actions on a 5-point Likert-type scale, ranging from "1" = does not describe me at all to "5" = describes me very well. As Item 2 (I have a hard time making it through stressful events), Item 4 (It is hard for me to snap back when something bad happens) and Item 6 (I tend to take a long time to get over set-backs in my life) were reverse-coded, the data collected were recoded prior to analysis. High scores obtained from the scale after the items coded in reverse order are translated in the scale indicate high psychological resilience (Smith et al., 2008). The factor loads for the items were found between 0.68 and 0.91 in Turkish sample (Dogan, 2015). In this study, Cronbach's alpha of the BRS was 0.69.

Statistical Analysis

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.The Mann–Whitney U test was utilized for comparing the continuous variables among two groups. Kruskal-Wallis test was used to evaluate possible differences between the more than two groups and the level of significance was determined after the Dunn multiple comparison tests with Bonferroni correction test. Multiple linear regression model was used with backward elimination technique to investigate potentially predictive factors for the somatic distress. The variables evaluated were determined as significant variables derived from our results and literature review, in accordance with clinical experience. The variables used for the models are as follows; age (years), gender, education levels (years), additional chronic disease, history of psychiatric disorders, present treatment (any treatment, follow-up), metastasis anxiety, stressful life events, BRS, and intrusions. 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.).

Results and Discussion

Sociodemographic and Clinic Characteristics

The demographic-clinical characteristics of participants are summarized in Table 1.125 (57.9%) of 216 participants were female and 168 (77.8%) were married. The median age was 52 years (IQR= 45 to 61 years), median education levels was 5 years (IQR= 5 to 8 years), and time since current diagnosis was 18 months (IQR= 7 to 36 months).

Table 1. Demographic and clinical characteristics

Variables	n (%)/*Median (IQR)*	[95% CI]
Age, years,	52 (45-61)	[49.5-54.0]
Gender		
Female	125 (57.9)	[51.4-64.3]
Male	91 (42.1)	[35.7-48.6]
Marital status		
Married	168 (77.8)	[72.7-83.3]
Single	24 (11.1)	[6.9-15.3]
Widowed/Divorced	24 (11.1)	[7.0-15.3]
Education, years	5 (5-8)	[5.0-5.0]
Literate	40 (18.5)	[13.4-24.1]
Primary education	125 (57.9)	[51.9-64.4]
High school and above	51 (23.6)	[18.1-29.6]
Employment Status		
Employed	23 (10.6)	[6.9-14.8]
Not Employed	193 (89.4)	[85.2-93.1]
Household economic situation		
Bad	124 (57.4)	[50.9-64.4]
Average	90 (41.7)	[34.7-47.7]
Good or very good	2 (0.9)	[0.0-2.3]
Additional Chronic Disease		
No	128 (59.3)	[52.3-65.7]
Yes	88 (40.7)	[34.3-47.7]
History of Psychiatric Disorders		
No	168 (77.8)	[72.2-82.9]
Yes	48 (22.2)	[17.1-27.8]
Cancer type		
Breast	79 (36.6)	[30.1-43.1]
Esophageal/gastrointestinal	59 (27.3)	[21.3-32.9]
Lung	17 (7.9)	[4.2-11.6]
Gynecologic	15 (6.9)	[3.7-10.6]
Head and neck	9 (4.2)	[1.9-6.9]
Sarcoma	7 (3.2)	[0.9-6.0]
Others	30 (13.9)	[9.7-18.5]
Current or completed treatment		
Chemotherapy	62 (28.7)	[27.2-35-2]
Surgery	3 (1.4)	[0.0-3.2]
Radiation	1 (0.5)	[0.0-1.4]
Hormone therapy	1 (0.5)	[0.0-1.4]
Surgery + Chemotherapy	76 (35.2)	[28.7-41.7]
Chemotherapy + Radiation	15 (6.9)	[3.7-10.6]
Surgery + Chemotherapy + Radiation	53 (24.5)	[19.0-30.1]
No treatment	5 (2.3)	[0.5-4.6]
Present treatment		
Any treatment	147 (68.1)	[61.6-74.5]
Follow-up	69 (31.9)	[25.5-38.4]
Metastasis		
No	169 (78.2)	[72.7-83.8]
Yes	47 (21.8)	[16.2-27.3]

Variables	n (%)/*Median (IQR)*	[95% CI]
Time since current diagnosis, months	18 (7-36)	[12-24]
Fear of catching COVID-19		
No	130 (60.2)	[53.7-66.2]
Yes	86 (39.8)	[33.8-46.3]
Fear of cancer recurrence during pandemic		
No	148 (68.5)	[62.5-75.0]
Yes	68 (31.5)	[25.0-37.5]
Fear of not getting appropriate and timely treatment during pandemic		
No	134 (62.0)	[55.1-69.0]
Yes	82 (38.0)	[31.0-44.9]

*CI: Confidence Interval; IQR: Interquartile range 25%-75%

Cancer type of 216 patients were 79 (36.6%) breast, 59 (27.3%) esophageal/gastrointestinal, 17 (7.9%) lung, 15 (6.9%) gynecologic, 9 (4.2%) head and neck, 7 (3.2%) sarcoma, and 30 (13.9%) others. Most of current or completed treatments were 76 (35.2%) surgery + chemotherapy, 62 (28.7%) chemotherapy, and 53 (24.5%) surgery + chemotherapy + radiation. Among 216 participants 147 (68.1%) had any current treatment, and 47 (21.8%) had metastasis.

Analyzes of association between demographic-clinical characteristics and stressful life events, BRS, somatic distress, PTSD, depression, anxiety, and stress symptoms were given in Table 2 and Table 3.

Stressful life events list due to the pandemic

The median of stressful life events due to the pandemic that the participants experienced was 3 (IQR= 1 to 5) (Table 3). Among 216 patients were 9 (4.2%) diagnosed with COVID-19, 7 (3.2 %) hospitalized, and 14 (%6.5) mandatory quarantined. The stressful life events due to the pandemic that participants reported are summarized in Table 2.

Psychometric Properties for Scales and Subscales

The median of PHQ-15 total score was 8 (IQR= 4 to 12). Somatic distress severity levels were 27.8% minimal, 34.3% mild, 19.9% moderate, and 18.1% severe. The medians of PCL-5 total score, intrusions, avoidance, NACM and hyperarousal were 25 (IQR= 8 to 43), 6 (IQR= 2 to 11), 2 (IQR= 0 to 4), 9 (IQR= 2 to 15) and 7 (IQR= 2 to 13), respectively. The median of BRS was 19 (IQR= 17 to 23). Among the participants moderate to severe somatic distress rate was % 38 and probable PTSD rate was 20.4%. Depression, anxiety and stress symptoms were 36.1%, 49.1% and 45.4%, respectively, from mild to extremely severe at any level. The psychometric properties of self-rating questionnaires and cancer patients' severity levels in accordance to questionnaires cutoff points were presented in Table 4.

Comparisons of the somatic distress groups in terms of self-rating inventories

Kruskal–Wallis test were evaluated to compare differences among somatic symptom severity groups [Minimal (1), Mild (2), Moderate (3), and Severe (4)] in terms of PCL-5 total score , intrusions, avoidance, NACM, hyperarousal, DASS-21-total score, depression, anxiety, stress, BRS, and stressful life events (Table 4).

There were statistically significant differences among somatic symptom severity groups in PCL-5 total score [H(3) =32.77, p<0.001], intrusions [H(3) =24.60, p<0.001], avoidance [H(3) =34.47, p<0.001], NACM [H(3) =22.38, p<0.001], and hyperarousal [H(3) =19.58, p<0.001]. There were statistically significant differences among somatic symptom severity groups in DASS-21-total score [H(3) =56.40, p<0.001], depression [H(3) =50.47, p<0.001], anxiety [H(3) =60.73, p<0.001], and stress [H(3) =34.36, p<0.001]. There were statistically significant differences among somatic symptom severity groups in BRS [H(3) =21.20, p<0.001], and stressful life events [H(3) =14.46, p=0.002].

Multiple linear regression analyses for somatic distress

Multiple linear regression was carried out for predicting somatic distress (Table 5). Low educations levels, high anxiety levels, high experience stressful life events, and low psychological resilience predicted high somatic distress levels (N = 216, R^2 = 0.375, $F_{(4, 211)}$ = 31.65, p <0.001).

Table 2. Stressful life events list due to the pandemic

n=216	n (%)	[95% CI]
Diagnosed with COVID-19	9 (4.2)	[1.9-7.4]
Hospitalized due to COVID-19	7 (3.2)	[0.9-5.6]
Mandatory quarantined due to COVID-19	14 (6.5)	[3.7-10.2]
A family member or a close friend diagnosed with COVID-19	42 (19.4)	[14.4-25.9]
A family member or a close friend hospitalized due to COVID-19	28 (13.0)	[8.8-17.6]
Experienced the death of a spouse/child due to COVID-19	7 (3.2)	[0.9-6.0]
Experienced the death of a close friend or a family member (except spouse/child) due to COVID-19	24 (11.1)	[6.9-15.7]
Felt the covid-19 disease is threatening his/her life	114 (52.8)	[45.8-59.7]
Felt the covid-19 disease is threatening life of spouse/child	116 (53.7)	[47.2-60.2]
Felt the covid-19 disease is threatening life of a close friend or my a family member (except spouse/child)	94 (43.5)	[37.0-50.0]
Witnessed deaths in an occupation (doctor, nurse, police, etc.) due to COVID-19	8 (3.7)	[1.4-6.0]
Forced to work during the pandemic	9 (4.2)	[1.9-6.9]
Lost job due to the pandemic	16 (7.4)	[4.2-11.1]
Experienced serious economic difficulties due to the pandemic	84 (38.9)	[32.4-45.4]
Trouble meeting food needs due to the pandemic	45 (20.8)	[15.7-26.4]
Trouble meeting shelter needs due to the pandemic	21 (9.7)	[6.0-13.4]
Trouble meeting health needs due to the pandemic	44 (20.4)	[15.3-25.9]
Experienced/witnessed an extremely stressful event due to the pandemic that have not yet mentioned to anyone	18 (8.3)	[4.6-12.0]

COVID-19: Corona Virus Disease 2019

Table 3. Psychometric Properties for Self-Rating Scales and Subscales

Scales		n (%)/ Median (IQR)	[95% CI]	Cronbach α
PHQ-15 total score		8 (4-12)	[7-9]	0.867
	Minimal (0-4)	60 (27.8)	[21.8-33.8]	
	Mild (5-9)	74 (34.3)	[28.2-40.3]	
	Moderate (10-14)	43 (19.9)	[14.8-25.5]	
	Severe (≥15)	39 (18.1)	[13.0-23.6]	
PCL-5 total score		25 (8-43)	[20-29]	0.965
	Intrusions	6 (2-11)	[5-7]	0.899
	Avoidance	2 (0-4)	[0-3]	0.875
	NACM	9 (2-15)	[7-10.5]	0.910
	Hyperarousal	7 (2-13)	[6-9]	0.926
PCL-5 cut off score				
	≥47	44 (20.4)	[14.8-25.9]	
	47 below	172 (79.6)	[74.1-85.2]	
DASS-21total score		23 (10-39.5)		0.930
Depression-total		6 (2-12)	[18-28]	0.867
			[4-8]	
	Normal (0-9)	138 (63.9)	[57.9-70.4]	
	Mild (10-12)	25 (11.6)	[7.4-15.7]	
	Moderate (13-20)	28 (13.0)	[8.8-18.1]	
	Severe (21-27)	14 (6.5)	[3.2-10.2]	
	Extremely Severe (28-42)	11 (5.1)	[2.3-8.3]	
Anxiety-total		6 (2-12)	[6-8]	0.788
	Normal (0-6)	110 (50.9)	[44.4-57.9]	
	Mild (7-9)	27 (12.5)	[8.3-17.1]	
	Moderate (10-14)	40 (18.5)	[13.4-23.6]	
	Severe (15-19)	23 (10.6)	[6.9-14.8]	
	Extremely Severe (20-42)	16 (7.4)	[4.2-11.1]	
Stress-total		10 (4-16)	[8-12]	0.830
	Normal (0-10)	118 (54.6)	[48.1-60.6]	
	Mild (11-18)	63 (29.2)	[27.7-35.2]	
	Moderate (19-26)	23 (10.6)	[6.5-14.8]	
	Severe (27-34)	9 (4.2)	[1.9-6.9]	
	Extremely Severe (35-42)	3 (1.4)	[0-3.2]	
BRS total score		19 (17-23)	[18-20]	0.693
Stressful life events score		3 (1-5)	[3-3]	0.738

CI: Confidence Interval; IQR: Interquartile range 25%-75%; PHQ-15: Patient health questionnaire-15; PCL-5: Posttraumatic stress disorder checklist for DSM-5; NACM: Negative alterations in cognitions and mood; DASS-21: Depression, anxiety and stress scale-21; BRS: Brief resilience scale.

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Table 4. Comparisons of self-ratingscales in somatic distress groups

N=216	Minimal (1) n=60 median (IQR)	Mild (2) n=74 median (IQR)	Moderate (3) n=43 median (IQR)	Severe (4) n=39 median (IQR)	H†	p	Differences Between Groups
PCL-5 total	17 (3.25-27)	25 (3-42)	28 (14-39)	47 (29-57)	32.77	<0.001	1=2, 1<3, 1<4, 2=3, 2<4, 3<4
Intrusions	3.50 (0.25-6)	6 (1.75-10)	6 (3-10)	13 (6-16)	24.60	<0.001	1=2, 1<3, 1<4, 2=3, 2<4, 3<4
Avoidance	1 (0-3)	2 (0-4)	2 (1-4)	5 (3-6)	34.47	<0.001	1=2, 1=3, 1<4, 2=3, 2<4, 3<4
NACM	5 (0-10)	9.50 (1-16)	10 (4-14)	14 (9-21)	22.38	<0.001	1=2, 1=3, 1<4, 2=3, 2=4, 3=4
Hyperarousal	5 (0-10.75)	6 (0-12)	8 (4-13)	13 (6-19)	19.58	<0.001	1=2, 1=3, 1<4, 2=3, 2<4, 3=4
DASS-21-total	10 (2.50-22)	18 (10-36.50)	30 (20-42)	42 (30-62)	56.40	<0.001	1<2, 1<3, 1<4, 2=3, 2<4, 3=4
Depression	2 (0-4)	4 (2-10)	8 (6-14)	14 (8-22)	50.47	<0.001	1=2, 1<3, 1<4, 2=3, 2<4, 3=4
Anxiety	2 (0-4)	6 (2-12)	8 (6-12)	14 (10-18)	60.73	<0.001	1<2, 1<3, 1<4, 2=3, 2<4, 3=4
Stress	5 (0-12)	8 (3.50-14.50)	12 (6-18)	16 (12-22)	34.36	<0.001	1=2, 1<3, 1<4, 2=3, 2<4, 3=4
BRS total	22 (18-25)	20 (17-23)	18 (16-22)	17 (13-19)	21.20	<0.001	1=2, 1<3, 1<4, 2=3, 2=4, 3=4
Stressful life events	2 (0-4)	3 (1-4)	4 (2-6)	4 (2-7)	14.46	0.002	1=2, 1<3, 1<4, 2=3, 2=4, 3=4

Table 5. Multiple linear regression analyses for somatic distress†

	Unstandardized Coefficients		ß	t	p	95% CI	
	B	SE				Lower Bound	Upper Bound
Education, years	-0.21	0.07	-0.16	-3.06	0.002	-0.35	-0.07
Anxiety	0.30	0.04	0.38	6.54	<0.001	0.21	0.40
Stressful life events	0.44	0.13	0.20	3.40	0.001	0.18	0.70
BRS	-0.17	0.06	-0.16	-2.65	0.009	-0.31	-0.04

†: N = 216, R^2 = 0.375, $F(4, 211)$ = 31.65, p <0.001. B: Unstandardized Coefficients; ß: Adjusted Coefficients; SE: Standard Error of the Estimate; CI: Confidence Interval. BRS: Brief resilience scale

The current researches during COVID-19 have not yet addressed somatic distress among cancer patients. The aims of this study are to investigate the somatic distress, PTSD, depression, anxiety, and stress levels of cancer patients whom already vulnerable population, and analyze the influencing factors on somatic distress during the pandemic. Main findings of this study; among the cancer patients moderate to severe somatic distress rate was % 38 and probable PTSD rate was 20.4%. Depression, anxiety and stress symptoms were 36.1%, 49.1% and 45.4%, respectively, from mild to extremely severe at any level. There were substantial association between somatic symptoms severity and high PTSD, anxiety, depression, and stress symptoms levels. Low educations levels, high anxiety levels, high experience stressful life events, and low psychological resilience predicted high somatic distress levels.

While the evidence of the psychological effects of the COVID-19 pandemic on the general population continues to increase, studies investigating the effects on special and sensitive populations such as cancer patients are gaining momentum. One of the first studies from China, Wang et al. (2020) showed that among 6213 cancer patients, 17.7% had anxiety, 23.4% had depression and 9.3% PTSD symptom. Chen et al. (online) reported that fear of disease progression, anxiety (16.5%) and depression (28.8%) was much higher in cancer patients under the COVID-19 outbreak than in the general population and then the cancer patients in times without an outbreak. Juanjuan et al. (2020) found that patients with breast cancer had high rates of anxiety, depression, distress, and insomnia in the peak time of the COVID-19 pandemic. Unlike Musche et al. (2020) found that 150 cancer patients under treatment had similar levels of distress and anxiety to healthy controls during the first days of the pandemic, but cancer patients had more adherent safety behavior. Similar to the majority of those studies, it is seen in our study that patients had high level of anxiety and stress insomuch that they were more afraid of catching COVID-19 (39%) or not being able to access treatment on time (38%) because of pandemic than the cancer recurrence (31.5%) in our study. Schellekens et al. (2020) also showed that patients were most afraid of being infected with COVID-19 (50.5%) and requiring treatment in the intensive care unit (58.0%).

To our knowledge, the current study is the first to address COVID-19-related PTSD, depression, anxiety, stress, as well as somatic symptoms (using PHQ) in cancer patients. We found only one study that has closely examined somatic symptoms' association with depression, anxiety and PTSD, focusing solely pain and fatigueas somatic symptoms. However, anxiety and stress, which cause aggravation of somatic symptoms such as pain or fatigue, is a well-studied area Grassi, Caruso & Nanni 2013; Brown, Kroenke; 2009). Somatic symptoms have already been reported in past pandemics even in general population and psychosomatic responses to these psychological effects should be considered (Chew et al., 2020). Based on this phenomenon, Chaturvedi reported his prediction of the prevalence of chronic pain and the severity of the pain experience may have increased during the COVID-19 pandemic process (Chaturvedi, 2020). Wang et al. (2020) evaluated only physical fatigue and pain intensity as somatic distress in cancer patients using the Visual Analogue Scale (VAS) in their study. They found that pain intensity was a risk factor for anxiety, depression and PTSD. We also found a significant relationship between the severity of somatic symptoms and the levels of anxiety, depression, PTSD and stress symptoms. The fact that patients with high anxiety levels, high stressful life events experience, and low psychological resilience seem most vulnerable to somatic distress among cancer patients' is another significant result of this study.

Anxiety, depression and PTSD is associated with somatic symptoms (Haug, Mykletun & Dahl, 2004; Bartel et al., 2020). It is thought that the somatic sensory processing mechanism extends to cognitive symptoms and reveals a potential generalization of the impairment in the cognitive and somatic domains in PTSD[31].In line with this, it is seen that 'negative alterations in cognitions and mood' are high in severe somatic distress in PTSD symptomology like other symptomatologies in this study. The COVID-19 outbreak, like other pandemics, was associated with a wide range of psychiatric comorbidities, including anxiety, panic, depression and trauma-related disorders. As a result, cancer patients may be experiencing more somatic distress after all these stressful life events, uncertainty and anxiety during this COVID-19 pandemic.

Psychological Resilience is the ability of an individual to adapt to and cope with adverse situations such as a trauma, threat, health issues (Connor & Davidson, 2003; Wingo et al., 2010). Resilience is protective against some mental disorders such as anxiety and PTSD while low psychological resilience is risk factor for mental disorders (Pietrzak et al.; 2009). Ran et al. (2020) showed that psychological distress was high at the peak level of COVID-19 outbreak in China, and was negatively correlated with resilience in the general population. Kimhi et al. (2020) showed that individual resilience and well-being were the first and most important predictors of COVID-19 related anxiety. Kavcic et al. (2020) suggested that resilience is of great importance factor that promotes good psychological functioning during COVID-19 outbreak. When these studies are considered together, it is an expected result that high anxiety and low psychological resilience also predict somatic distress in cancer patients during the COVID 19 process.

There are studies that report that less education is associated with greater somatic symptoms (Sayar Kirmayer & Taillefer, 2003; Zeleke, Minaye & Kygana; 2015). However, Sayar et al. (2003) reported that low education level predicted somatic symptoms due to comorbidity with depressive symptomology. Zeleke et al. (2015), on the other hand, showed that low education was associated with somatic symptoms in traumatic individuals. So Somatic symptoms may be more apparent in people with low education due to the overlap of COVID-9 stress in cancer patients who are already under own disease stress.

There are several limitations in this study. First, because its cross-sectional design, a cause-effect relationship in variables cannot be established. Whereas, knowing the pre pandemic situation could enable us to reveal the results more clearly. It is a limitation that self-assessment scales were used and additional psychopathologies were not able to screen with a structured interview like SCID. To better understand the impact of COVID-19 on cancer patients as well as somatic distress, large scale studies within the framework of longitudinal and prospective designs are needed.

Conclusions

This study focused on the psychological outcomes of the COVID 19 outbreak in cancer patients and its relation to somatic distress, which is already a gap in the literature. The results showed that the symptoms of depression, anxiety, stress, and PTSD increased, as well as somatic distress. Moreover, indicators predicting somatic distress were determined as; ''low education levels, high anxiety levels, experience of high stressful life events and low psychological resilience'', for which preventive measures should be planned in future studies.

Conflict of interest

The authors declare that there are no conflicts of interest.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The data that support the findings of this study are openly available in [XXX XXXXXX ethics committee], reference number [2020.06.1.11.082].

Informed consent

Informed consent was obtained from all individual participants included in the study.

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