Which One Causes More Anxiety: Pandemic or Cancer?

Özlem Sönmez  
Acibadem Mehmet Ali Aydınlar University: Acibadem Universitesi

Evrim Tezcanli Tjon A Meeuw (tezcanlievrim@gmail.com)  
Acibadem Healthcare Group: Acibadem Saglik Grubu  
https://orcid.org/0000-0001-7009-1073

Elif Şenocak Taşçı  
Acibadem Mehmet Ali Aydınlar University: Acibadem Universitesi

Hande Büşra Kazancı  
Acibadem Mehmet Ali Aydınlar University: Acibadem Universitesi

Ayşe Altınok  
Acibadem Mehmet Ali Aydınlar University: Acibadem Universitesi

Elvan Toklucu  
Acibadem Healthcare Group: Acibadem Saglik Grubu

Yusuf Taşçı  
Istanbul University: Istanbul Universitesi

Çise Aydoğdu  
Acibadem Healthcare Group: Acibadem Saglik Grubu

Ayşegül Bakır Aydın  
Acibadem Healthcare Group: Acibadem Saglik Grubu

Sabiha Yüce  
Acibadem Healthcare Group: Acibadem Saglik Grubu

Başak Oyan  
Acibadem Mehmet Ali Aydınlar University: Acibadem Universitesi

Research Article

Keywords: Pandemic, oncology, anxiety, COVID-19

DOI: https://doi.org/10.21203/rs.3.rs-721903/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.  
Read Full License
Abstract

Introduction:

We conducted a survey among cancer patients undergoing active oncology treatment to evaluate their psychological wellbeing during COVID-19 pandemic in comparison to healthy individuals and whether the COVID-19 anxiety affected treatment adherence.

Material and Methods

402 participants were included in the study; 193 were cancer patients receiving active treatment while 209 were healthy volunteers. Hospital anxiety and depression scale (HADS) and COVID-19 phobia scale (C19P-S) questionnaires were used.

Results

Patient group had significantly lower CP19-S compared to healthy individuals. Patients’ mean HADS-anxiety score was significantly higher. Mean depression scores were similar between patients and healthy volunteers. There were no treatment deferrals.

Conclusion

Although the pandemic increased levels of anxiety, oncology treatment continued to be a priority for cancer patients.

Introduction

Coronavirus disease 19 (COVID-19) has become an international public health emergency and the World Health Organization declared the pandemic on 11 March 2020 [1]. Since then, the mitigation procedures have imposed stress in the general population. Recent studies reported increased prevalence of psychological disorders due to the COVID-19 pandemic [2]. Oncology patients are expected to have additional anxiety since they are identified as a susceptible subgroup for COVID-19 with an increased risk of morbidity and mortality [3]. This information is supported by the studies reported from China and Italy where the case-fatality was higher in patients with cancer than those without (6% vs 2%, respectively) [4, 5].

Systemic treatments, especially cytotoxic therapies, are the cornerstone of cancer treatment in both adjuvant and palliative settings [6, 7]. It is well documented that the patient adherence to treatment plays an important role in the effectiveness [8]. Oncology patients may experience additional psychological burden in terms of contacting the disease since treatments require frequent hospital visits [2].
Additionally, the fear of experiencing a more severe course of COVID infection secondary to immunosuppressive state may prevent patients from applying to health care. For patients who are not receiving active treatment, the social distancing procedures and restrictions in access to care causing delays in follow-up visits may create additional fear of cancer recurrence [9].

It is important to determine the anxiety levels of oncology patients in order to avoid possible treatment delays due to increased stress levels caused by the pandemic. We conducted a survey among cancer patients undergoing active oncology treatment in order to evaluate their psychological wellbeing during COVID-19 pandemic and compared their anxiety, depression and COVID phobia scores with healthy individuals. We also aimed to see if COVID-19 anxiety affected treatment adherence.

**Materials And Methods**

**Participants and Study Design**

The study consisted of 402 participants of whom 193 were cancer patients undergoing chemotherapy, 199 of the participants were healthy volunteers. Patients receiving active chemotherapy at our oncology center between January and May 2021, during the second wave of pandemic, were included in this study. Healthy volunteers were the individuals who didn’t have a diagnosis of cancer.

Written informed consent was obtained from all participants after full explanation of the purpose and nature of the data collection. The study was approved by an institutional review board and a special permission was obtained from the Ministry of Health.

Participants were asked to complete hospital anxiety and depression scale (HADS) and COVID-19 phobia scale (C19P-S) questionnaires.

**Survey Structure**

The surveys included personal information, HADS and C19P-S questionnaires [10, 11].

The personal information form included questions to address participants’ demographic data including age, gender, occupation, education status, current living conditions and source of income. In addition, questions about their co-morbidities and preexisting/existing mental health conditions as well as their families were included. The questionnaire is a 20-item self-report instrument.

C19P-S was developed to assess the severity of COVID-19 phobia. The objects of the scale were created based on a comprehensive review of existing scales on fear, expert opinions, and participant interviews. C19P-S is a 20-item validated self-report instrument. All items in the scale are rated on a 5-point Likert-scale from “strongly disagree (1)” to “strongly agree (5)”. The higher score indicates a greater phobia.

HADS is a 14-item validated questionnaire developed by Zigmond and Snaith in 1983 [10]. It is used as a screening tool and severity measure for depression and anxiety. Although it was originally developed for
patients in hospitals, it is valid in community settings. The validity and reliability study of the scale in Turkey was carried out by Aydemir et al. [12]. It is a 14-item instrument rated on a 4-point Likert-scale. Anxiety and depression were independent measures. The possible scores ranged from 0 to 21 for anxiety and depression. The severity of anxiety/depression symptoms score is assessed as follows: 0–7: none, 7–11: mild, > 11: severe.

Phone Consult

All patients had an initial phone consultation with a member of our oncology team prior to their first treatment session during the initial phase of pandemic. They were given a detailed explanation of the precautions taken in order to ensure their safety.

Patient Treatment Adherence

All patients included in the study were followed-up for the duration of the study and their adherence to the treatment was reported.

Analysis

Data analysis was performed using SPSS (Statistical Package for the Social Sciences) version 25.0 (IBM Corp., Armonk, NY, USA) program. Descriptive statistical methods as well as Shapiro-Wilk and Kolmogorov-Smirnov tests were used to evaluate if the data obtained normal distribution. Normally distributed quantitative data was evaluated with ANOVA (Variance) analysis and multiple comparisons were made with Tukey Test in groups where the difference was significant. Quantitative data with abnormal distribution was evaluated with the Kruskal-Wallis Test and the Mann-Whitney U test was used for multiple comparisons in groups with significant differences. Chi-Square (Pearson Chi-Square, Continuity Correction, Fisher's Exact Test) tests were used in categorical data analysis. In addition, the level of correlation between two variables was examined with Pearson or Spearman correlation tests. The results were evaluated at the 95% confidence interval and p < 0.05 were considered statistically significant.

Results

Demographic and clinical characteristics

Four hundred and two (402) participants completed the questionnaires; 193 (48%) were cancer patients and 209 (52%) were healthy volunteers. The mean age of the participants was 43.80 ± 13.49 years. 67.9% of the participants were female and 32.1% were male. Majority of them (69.7%) were married and living with family (92%). Two-hundred and forty-six (61.2%) participants were university graduates and 57.7% were employed. The detailed demographic patient characteristics are presented in Table 1.

Depression and anxiety
The mean anxiety score of all participants was 6.88 ± 3.95 (range:0–20). Anxiety scores of 250 (62.2%) participants were within normal ranges, 84 (20.9%) were mild and 68 (16.9%) were severe. While there was no difference between two groups in terms of anxiety levels, it was determined that the mean HAD-anxiety score of the patients was significantly higher (7.34 ± 3.82 vs 6.46 ± 4.04, p = 0.027). The mean depression score of all participants was 6.47 ± 3.63 (range:0–20). Depression levels of 248 (61.7%) participants were assessed as mild, while 103 (25.6%) had moderate and 51 (12.7%) had severe depression. The mean depression scores were similar between patients and healthy volunteers (p > 0.05). Statistical analyses revealed that COVID-19 phobia was an independent factor increasing the level of anxiety and depression in both groups. Details of the HADS assessment are presented in Table 2.

**Phobia**

All participants’ CP19-S mean score was 47.90 ± 15.05 (range:20–100); subgroup analysis is given in Table 2. The patient group had significantly lower CP19-S scores when compared to healthy individuals (45.76 ± 14.97 vs 49.89 ± 14.88, p = 0.006).

Patients with chronic disease and a history of a shocking, scary, or dangerous event had significantly higher CP19-S levels (p = 0.025 and p = 0.009). The same parameters were found to be independent factors increasing CP19-S score in the multiple linear regression model (p = 0.004) (Table 3).

Female gender (p = 0.003), having a chronic disease (p = 0.042) or diagnosis of psychiatric illness (p = 0.048) and being exposed to a shocking, scary, or dangerous event (p = 0.005) were statistically related to higher CP19-S levels in the healthy group. Moreover, in the multilinear regression models, age and female gender were found to be independent factors increasing CP19-S (p = 0.014 and p < 0.001). CP19-S evaluation details for both groups are presented in Table 4.

All participants reporting hospital anxiety were found to have significantly higher COVID-19 phobia levels (p < 0.05). There was no statistically significant correlation between depression levels and hospital anxiety among healthy volunteers (p > 0.05). However, the patients with hospital anxiety had significantly higher depression levels when compared to patients not reporting increased anxiety (p < 0.05). This correlation is presented in Table 5.

**Discussion**

To our knowledge this is the first study comparing the HADS and CP19P-S scores of oncology patients with healthy volunteers. Pandemic is a traumatic life event that affected all of the population. Cancer patients and survivors are especially prone to chronic distress and they experience long term psychological problems which are usually neglected. Regardless of cancer stage, whether curative or palliative, 10–20% of patients experience depression and anxiety [13]. Detection and prevention of distress is important since it can affect treatment adherence [14]. Several previously reported studies linked anxiety disorders to postponement of chemotherapy [15, 16].
Healthcare systems all around the world have been challenged by the COVID-19 pandemic. Although several precautions and adjustments were taken for the safety of oncology patients, they continued to experience high stress levels due to losses related to COVID-19. The initial studies that reported higher mortality rates for cancer patients added to the preexisting anxiety and depression of our patients, challenging them to make decisions between cancer and COVID [17].

In the current study, cancer patients had higher HADS scores when compared to the control group. However, their Covid-19 anxiety was significantly lower, which might have resulted in limited hospital anxiety leading to no treatment deferrals. Cancer remains to be the main life-threatening disease even during a pandemic, as COVID is a probability whereas cancer is a reality for our patient population. We attributed lower CP19-S scores to our telemedicine visits which aimed to address concerns of patients regarding safety measures for COVID-19. Informing our patients appropriately had critical importance in our pandemic strategy. Using telemedicine since the beginning of the pandemic resulted in no treatment postponements among our patients, although their wellbeing is affected more during the second wave of the pandemic. Karacin et al. [18], also used telemedicine as an important tool for the management of pandemic and investigated the effects of pandemic on the chemotherapy adherence. They reported lower chemotherapy deferral rates after this strategy was implemented.

Zhang et al. [19] investigated the psychological effects of chemotherapy interruption due to COVID-19 and they reported that especially patients with advanced refractory tumors had higher anxiety levels. They suggested phone counselling as a strategy to offer relief while reducing the psychological harm caused by treatment interruption. Although we found telemedicine interactions helpful, we agree that further psycho-social support should be provided for oncology patients in order to help them cope with the uncertainty. However, Rodrigues-Oliveira et al. [20] investigated the effect of COVID-19 on the anxiety levels of patients receiving RT for head and neck cancer using the HAD scale. His results suggested complying with treatment schedules despite increased COVID 19 anxieties. Although the radiotherapy treatment modality has a potentially more concerning schedule that necessitates a patient's daily presence at the hospital, when compared with chemotherapy, these patients also did not defer the RT even though telemedicine was not used.

Patients and healthy participants that reported increased anxiety for hospital visits, had significantly higher HAD anxiety, HAD depression and CP19-S scores. Although there wasn’t any significant correlation among healthy participants in terms of anxiety and depression scores, cancer patients reporting anxiety were also found to have significant levels of depression. We can speculate that a reason for increased depression can be the possibility of treatment interruption which led to fear of cancer recurrence and mortality. It is important to define the contributing factors as well as coping strategies. A periodical virtual mood assessment can help us define the patients at risk for depression. Although not shown in our study, depression may lead to treatment refusal and deferral. Giese-Davis et al. [21] reported longer survival in metastatic breast cancer patients when their depression is managed.
Several studies showed the link between depression and cancer survival. Survival after a cancer diagnosis is multifactorial and depends on several factors such as treatment adherence, immunity as well as self-care including smoking cessation, exercise and diet. Zimmaro et al. [22] reported shorter survival when head and neck cancer patients were depressed.

Our study has some limitations. Patients included in the present study were heterogeneous in terms of their cancer diagnoses and our control group selection itself might introduce a bias. Although we did not aim to make a case-control study, one can criticize the distinct characteristics of two groups included in this study. Another weakness of our study is that we did not have a baseline pre-pandemic psych evaluation, and neither of our questions addressed their psychological status before COVID.

**Conclusion**

Cancer patients are already vulnerable for depression and anxiety, the disease itself carries the stigma of a chronic, potentially fatal illness. Although the pandemic increased levels of anxiety, cancer treatment continued to be a priority in our patients’ lives and they aimed to continue their ongoing treatments without interruptions. Strategies including phone consults should be developed in order to support cancer patients coping with the pandemic and increase their courage to avoid treatment delays.

**Declarations**

**Funding:**

The authors have no other relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript. No writing assistance was utilized in the production of this manuscript.

**Conflicts of interest/Competing interests:** N/A

**Availability of data and material:** N/A

**Code availability:** N/A

**Author Contributions:**

O Sonmez conceived and designed the study. All contributed to the design, analysis and interpretation of the data. E Tezcanli prepared the first draft and all contributed to subsequent drafts and the final paper. All authors read and approved the final manuscript.

**Ethics Approval:**

The authors state that they have obtained appropriate institutional review board approval and have followed the principles outlined in the Declaration of Helsinki for all human or animal experimental
investigations.

**Consent to participate:** Informed consent was obtained from all individual participants included in the study.

**Consent for publication:** N/A

**References**

1. C D (2020) M. V. WHO declares COVID-19 a pandemic. Acta Biomed 91(1):157–160
2. Özdin S, Bayrak Özdin Ş (2020) Levels and predictors of anxiety, depression and health anxiety during COVID-19 pandemic in Turkish society: The importance of gender. Int J Soc Psychiatry 66(5):504–511
3. Aylward B, Liang W (2020) Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19). WHO-China Jt Mission Coronavirus Dis 2019 2019(February):16–24
4. Wu Z, McGoogan JM (2020) Characteristics of and Important Lessons from the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72314 Cases from the Chinese Center. for Disease Control and Prevention, American Medical Association
5. Onder G, Rezza G, Brusaferro S (2020) Case-Fatality Rate and Characteristics of Patients Dying in Relation to COVID-19 in Italy. American Medical Association
6. Sonpavde G, Wang CG, Galsky MD, Oh WK, Armstrong AJ (2015) Cytotoxic chemotherapy in the contemporary management of metastatic castration-resistant prostate cancer (mCRPC). Blackwell Publishing Ltd
7. Anampa J, Makower D, Sparano JA (2015) Progress in adjuvant chemotherapy for breast cancer: An overview. BioMed Central Ltd.
8. Salazar MC, Rosen JE, Wang Z et al (2017) Association of delayed adjuvant chemotherapy with survival after lung cancer surgery. JAMA Oncol 3(5):610–619
9. van de Haar J, Hoes LR, Coles CE et al. Caring for patients with cancer in the COVID-19 era, Nature Research, (2020)
10. Snaith RP (2003) The hospital anxiety and depression scale. Health Qual Life Outcomes 1(1):1–4
11. Arpaci I, Karataş K, Baloğlu M. The development and initial tests for the psychometric properties of the COVID-19 Phobia Scale (C19P-S). *Pers. Individ. Dif.* 164 (2020)
12. Aydemir Ö, Güvenir T, Küey L, Kültür S (1997) Hastane Anksiyete ve Depresyon Ölçeği Türkçe Formunun Geçerlilik ve Güvenilirlik Çalışması. Türk Psikiyatr Derg 8(4):280–287
13. Pitman A, Suleman S, Hyde N, Hodgkiss A. Depression and anxiety in patients with cancer. *BMJ, 361, k1415* (2018)
14. Fielding R. Developing a preventive psycho-oncology for a global context. The International Psycho-Oncology Society 2018 Sutherland Award Lecture. *Psychooncology* 28(8), 1595–1600
15. Greer JA, Pirl WF, Park ER, Lynch TJ, Temel JS (2008) Behavioral and psychological predictors of chemotherapy adherence in patients with advanced non-small cell lung cancer. J Psychosom Res 65(6):549–552

16. Zhu L, Tong YX, Xu XS, Xiao AT, Zhang YJ, Zhang S (2020) High level of unmet needs and anxiety are associated with delayed initiation of adjuvant chemotherapy for colorectal cancer patients. Support Care Cancer 28(11):5299–5306

17. Onder G, Rezza G, Brusaferro S (2020) Case-Fatality Rate and Characteristics of Patients Dying in Relation to COVID-19 in Italy. JAMA - J Am Med Assoc 323(18):1775–1776

18. Karacin C, Bilgetekin I, Basal B, Oksuzoglu F (2020) OB. How does COVID-19 fear and anxiety affect chemotherapy adherence in patients with cancer. Futur Oncol 16(29):2283–2293

19. Zhang H, Yin J, Wang X et al (2021) Patients’ Responses to the Sudden Interruption of Chemotherapy During the Outbreak of the Novel Coronavirus: A Cross-Sectional Study. Cancer Manag Res 13:351–358

20. Rodrigues-Oliveira L, Kauark-Fontes E, Alves CGB et al. COVID-19 impact on anxiety and depression in head and neck cancer patients: A cross-sectional study. Oral Dis. (2021)

21. Giese-Davis J, Collie K, Rancourt KMS, Neri E, Kraemer HC, Spiegel D (2011) Decrease in depression symptoms is associated with longer survival in patients with metastatic breast cancer: A secondary analysis. J Clin Oncol 29(4):413–420

22. Zimmaro LA, Sephton SE, Siwik CJ et al (2018) Depressive symptoms predict head and neck cancer survival: Examining plausible behavioral and biological pathways. Cancer 124(5):1053–1060

**Tables**

Due to technical limitations, table 1,2,3,4,5 is only available as a download in the Supplemental Files section.

**Supplementary Files**

This is a list of supplementary files associated with this preprint. Click to download.

- tables.pdf