

Survey Analysis of Anxiety in Gynecological Cancer Patients in the SARS-CoV-2 Pandemic

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Introduction: The study aimed to evaluate the relationship between anxiety and SARS-CoV-2-related anxiety in obstetrics and gynecology patients who received systemic anticancer therapy and did not receive any treatment through questionnaires measuring stress.

Materials and Methods: This non-invasive observational survey study was conducted between February 2017 and June 2021. Demographic and clinical data such as age, gender, type of cancer, and type of treatment were collected from the patients' medical histories. Patients were asked to participate in the STAI-1, 2, Covid-19 Stress (C19S), and Distress Thermometer (DT) questionnaires to measure their fear/anxieties about the SARS-CoV-2 coronavirus. Chemotherapy (CT) and Radiotherapy (RT) were recorded and analyzed for each patient.

Results: Cancer significantly affected STAI-1, STAI-2 C19S, and DT scores. Patients with cancer had 1.39-fold higher (95%CI: 1.32-1.47) STAI-1 scores than those without cancer ($p < 0.001$). Similarly, patients with cancer had 1.37 times (95%CI: 1.3-1.45) higher STAI-2 scores than patients without cancer ($p < 0.001$). In the analysis for C19S score, cancer had 1.41 times (95%CI: 1.32-1.52) higher C19S than patients without cancer ($p < 0.001$). For DT scores, this ratio was 1.65 times (95%CI: 1.5-1.8) ($p < 0.001$). University education, chronic illness, psychological drugs, and age did not affect STAI-1, STAI-2, C19S, and DT ($p > 0.05$).

Conclusion: Cancer patients have been subject to a strong challenge in the care of mental health symptoms during the pandemic. According to our study, cancer patients were affected by this condition for anxiety, and therefore clinicians should remain vigilant for mood complications.

Keywords: SARS-CoV-2, anxiety, Covid-19 Stress, Distress Thermometer, STAI

Introduction

The coronavirus disease caused by the SARS-CoV-2 Virus, announced in early 2020, killed 600,000 people in one year (1). The coronavirus not only resulted in a high mortality disease, but it caused social functioning changed and view of health in all areas of life entirely (2, 3). As the process progresses, the increasing morbidity

and mortality of Covid-19, which is associated with many diseases, has led to changes in the understanding of medicine (4, 5). Some Covid-19 preventive practices were implemented by the scientific committee established in our country (6,7). Some of these included: the constant wearing of masks, social distancing restrictions, no crowded meetings, limiting the

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Received: Nov 3, 2022 **Accepted:** Nov 27, 2022

Published: Sep 9, 2022

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The Ulutas Medical Journal © 2022



number of stores, and temporary closure of restaurants (8, 9). In hospitals, regulations such as visitor restriction, reduction in elective surgery, removal of systemic treatment, change of chemotherapy regimens, extension of intervals between cycle and implementation of teleconsultations were introduced (10). Although these measures proved very beneficial and reduced the number of infected individuals, with Covid-19 mortality, many patients with cancer had to change places where they received systemic treatment, resulting in varying proportions of anxiety (11).

According to recent studies, the pandemic has been shown to cause various mental changes such as intense posttraumatic stress, depression, insomnia, fear, and anxiety that reduce patients' quality of life and adversely affect compliance with medical treatment (12). Especially the patients in the obstetrics clinics, which consisted of female patients, were significantly affected by the process (13). Cancer patients followed up in this patient group were also affected by the devastating effect of the Covid-19 process (14).

The study evaluates the relationship between anxiety and SARS-CoV-2-related anxiety in obstetrics & gynecology patients who received systemic anticancer therapy and did not receive any treatment through questionnaires measuring stress through different methods.

Materials and Methods

Ethical Statement

This non-invasive observational survey study was conducted between February 2017 and June 2021. The study was approved by the local ethics committee (date: 27/01/2021 - ID: 2021-01/908). This study was carried out in accordance with the Declaration of Helsinki.

Study Design

All patients have signed a written consent for treatment and data analysis. The treatment has not been changed by the design of this study. Eligible patients at the obstetrics clinic were

selected from adults 18 years of age and older with histopathologic confirmation of malignant neoplasm who received systemic oncological therapy and at least one treatment cycle during the study. Patients who could not complete the questionnaires on their own and those with an unclear diagnosis of psychiatric disorders were excluded from the study. Demographic and clinical data such as age, gender, type of cancer, and type of treatment were collected from the patients' medical histories. Patients were asked to participate in the STAI-1, 2, C19S, and DT questionnaires to measure their fear/anxieties about the SARS-CoV-2 corona virus. Chemotherapy (CT) and Radiotherapy (RT) were recorded and analyzed for each.

C19S scale

In the questionnaire study of Covid-19 Stress (C19S), we used the scale designed by Ahorsu et al. (15) as "FCS" and the Turkish version of the scale adapted by Bakioğlu et al. (16). In this form, where high scores from the scale mean that there is a high level of fear of Covid-19, the system was as follows: There are seven statements related to fear of Covid-19, and the scoring range is between 7 and 35.

STAI scale

We assessed fear or anxiety with the STAI score developed by Spielberger and adapted to the Turkish population (17). STAI is a self-test application with two primary subscales (STAI-1 and STAI-2) that evaluates trait anxiety levels and consists of 20 items. Scores from each scale increase with the severity of anxiety symptoms.

Distress Thermometer

The Distress Thermometer (DT) is a single-item, 11-point visual analogue scale, with respondents indicating how distressed they have felt over the past week (18). The scale is the most frequently used mood scale in cancer and palliative settings, and the most frequently used reference measure in cancer populations.

Statistical Analysis

This power analysis calculation required a total sample size of at least 255. The sample size was estimated based on a hypothetical prevalence of fear with 80% power of the test with a 5% margin of error to be tolerated at a 95% confidence. Statistical analysis was performed using the Statistical Package for Social Sciences ver.22. Demographic and clinical data were analyzed using descriptive. The relationship between demographic/clinical characteristics and distress was investigated with correlations, independent t-tests, and analysis of variance.

Results

Demographic data

A total of 302 patients participated in the present study. The mean age of the patients was 49.15 ± 12 years, and the age range was between 19-83. Cancer was diagnosed in 179 (59.3%) patients, while 123 (40.7%) did not have any cancer. The 179 cancer patients were listed as follows according to the affected regions: 36 (20.1%) endometrium, 85 (47.5%) breast, 33 (18.4%) ovary, 23 (12.8%) cervix, and 2 (1.2%) uterus. Sixty-four (21.2%) of the patients had a diagnosis of Covid-19. Twenty (6.6) patients died from Covid-19. Twenty-one (7%) of the patients were receiving psychiatric medication.

Relationship of Scores to Cancer Patients

Cancer significantly affected STAI-1, STAI-2 C19S, and DT scores. Patients with cancer had 1.39-fold higher (95%CI:1.32-1.47) STAI-1 scores than those without cancer ($p < 0.001$). Similarly, patients with cancer had 1.37 times (95%CI: 1.3-1.45) higher STAI-2 scores than patients without cancer ($p < 0.001$). In the analysis for C19S score, cancer had 1.41 times (95%CI: 1.32-1.52) higher C19S than patients without cancer ($p < 0.001$). For DT scores, this ratio was 1.65 times (95%CI: 1.5-1.8) ($p < 0.001$). University education, chronic illness, psychological drugs, and age did not affect STAI-1, STAI-2, C19S, and DT ($p > 0.05$).

Relationship of Scores to Cancer Treatments

The STAI-1 scores of the patients who received CT were 1.16 times [95% CI: 1.03-1.32] than the STAI-1 scores of the patients who had cancer but did not receive additional tx ($p < 0.001$). STAI-1 scores of the patients who received RT were 1.13 times the STAI-1 scores of the patients who had cancer but did not receive additional tx [95 %CI: 1.01-1.27] is higher ($p < 0.001$). The STAI-1 scores of patients who received CT+RT were 1.18 times [95% CI: 1.05-1.33] more elevated than the STAI-1 scores of patients who had cancer and did not receive additional tx ($p < 0.001$). The STAI-2 scores of patients with cancer who received CT+RT treatment were 1.14 times [95% CI: 1.02-1.28] higher than patients with cancer who did not receive treatment ($p < 0.001$). RT ($p = 0.06$) and CT ($p = 0.09$) had no effects on STAI-2 scores.

The C19S of cancer patients who received CT, RT, and CT+RT were higher than those who did not receive treatments ($p < 0.001$). The C19S of the patients who received KT were 1.22 times [95% CI: 1.05-1.41] than the C19S of the patients who had cancer but did not receive additional tx ($p < 0.001$). 1.29 times [95%CI: 1.13-1.48], and C19S of patients who received LT+RT were 1.26 times [95% CI: 1.10-1.45] higher than the C19S of patients who had cancer but did not receive additional tx ($p < 0.001$).

Only RT($p = 0.001$) and CT+RT($p < 0.001$) among additional tx types for cancer patients had significant effects on DT scores. The DT scores for those who received CT, RT, and CT+RT were higher than those who had cancer and did not receive these treatments. The DT scores who received RT were 1.33 times (95%CI: 1.13-1.58) than the DT scores who had cancer but did not receive additional tx ($p < 0.001$), and the DT scores of the patients who received CT+RT were 1.38 times the DT scores of the patients who had cancer but did not receive additional tx (95%CI: 1.16-1.64) is higher ($p < 0.001$).

The scores of patients with and without cancer

For the C19S and DT score, in the analysis made on patients with and without cancer; there was no difference in terms of working and unemployed, chronic disease and non-user, psychological drug user and non-use, age groups, and educational status ($p>0.05$). As explained in Table 1, the comparative analysis found significance in the many parameters. A significant difference was found between the DT scores of patients using and not using psychological drugs ($p=0.045$). The DT score of those who used psychological drugs with

Score comparison for patients with cancer

cancer was higher than the DT score of those who did not have cancer (Table-2). There was no difference between the patient groups with breast, cervix, endometrial and ovarian cancer in terms of STAI-1 ($p=0.815$), STAI-2 ($p=0.462$), C19S ($p=0.265$) and DT ($p=0.718$) scores. In terms of STAI-1 ($p=0.03$) and STAI-2 score ($p=0.021$), a difference was found between the patient groups whose time value was 2021, 2020, 2019, 2018, and before 2017—the STAI-1 who were between 2021 and 2017 and before differed from each other ($p=0.021$). Again, the

Table 1. COVID-19 fear score

Variables		n	Cancer (-)	p-value	n	Cancer (+)	p-value	p-value
Worker	No	84	14 (21)	0.46 Ψ	138	23 (28)	0.999 Ψ	<0.001* Ψ
	Yes	39	14 (19)		41	22 (28)		<0.001* Ψ
Educational Status	Primary	42	14 (21)	0.772 Φ	76	23 (27)	0.856 Φ	<0.001* Ψ
	Middle	16	14 (16)		22	22 (28)		<0.001* Ψ
	High	32	13.5 (19)		60	22 (20)		<0.001* Ψ
	University	33	14 (17)		21	23 (28)		<0.001* Ψ
Chronic Disease	No	86	14 (19)	0.471 Ψ	106	22 (28)	0.302 Ψ	<0.001* Ψ
	Yes	22	14 (21)		73	23 (28)		<0.001* Ψ
Psychological Medicine	No	110	14 (21)	0.392 Ψ	162	23 (28)	0.107 Ψ	<0.001* Ψ
	Yes	5	13 $\pm$ 2.65		16	19.81 $\pm$ 7.15		0.054 Ψ
Age	<40	34	14 (16)	0.472 Φ	35	22 (27)	0.295 Φ	<0.001* Ψ
	41-50	37	14 (21)		52	22 (24)		<0.001* Ψ
	51-60	22	15.77 $\pm$ 4.35		38	21.61 $\pm$ 3.85		<0.001* Ψ
	>61	10	13.1 $\pm$ 2.6		37	23.14 $\pm$ 4.38		<0.001* Ψ

* $p<0.05$ - Ψ Two-sample t-test - Ψ Mann-Whitney U test - Φ Kruskal-Wallis test

Table 2. Distress score

Variables		n	Cancer (-)	p-value	n	Cancer (+)	p-value	p-value
Worker	No	84	4 (7)	0.834 Ψ	138	7 (7)	0.606 Ψ	<.001* Ψ
	Yes	38	4 (6)		41	7 (8)		<.001* Ψ
Educational Status	Primary	42	3.5 (6)	0.889 Φ	76	6 (7)	0.352 Φ	<.001* Ψ
	Middle	16	3.5 (5)		22	7 (5)		<.001* Ψ
	High	32	4 (7)		60	7 (6)		<.001* Ψ
	University	32	4 (6)		21	7 (8)		<.001* Ψ
Chronic Disease	No	85	4 (7)	0.667 Ψ	106	7 (8)	0.536 Ψ	<.001* Ψ
	Yes	22	4 (6)		73	7 (7)		<.001* Ψ
Psychological Medicine	No	109	4 (7)	0.798 Ψ	162	7 (8)	0.045* Ψ	<.001* Ψ
	Yes	5	4 (2)		16	8 (7)		<.001* Ψ
Age	<40	34	4 (7)	0.245 Φ	35	7 (8)	0.499 Φ	<.001* Ψ
	41-50	36	4 (6)		52	7 (7)		<.001* Ψ
	51-60	22	4 (5)		38	6.5 (5)		<.001* Ψ
	>61	10	3 (3)		37	7 (6)		<.001* Ψ

* $p<0.05$ - Ψ Mann-Whitney U test - Φ Kruskal-Wallis test

STAI-1 score of 2020 patients and the score of 2017 and earlier were different from each other ($p=0.003$). The STAI-2 scores of 2021 patients and the scores of 2017 and before differed from each other ($p=0.012$). The 2020 STAI-2 score and the score of the patients in and before 2017 differed from each other ($p=0.002$). The groups that differed in the C19S and DT scores were: patients with 2021 and 2017 and earlier, and patients with 2020 and before 2017, the C19S score ($p<0.001$).

Discussion

The questionnaire we describe here, in a cohort of participants with healthy and with cancer who received anticancer treatment for different cancer types in gynecology clinics, examined the course of anxiety and fear symptoms and quality of life compared to the treatments they received during the SARS-CoV-2 pandemic. Consistent with our hypothesis, we found evidence of a clinically significant increase in mental health symptoms and a clinically significant increase in anxiety values in the cancer and healthy patient groups. Therefore, cancer patients were affected in terms of mental health and anxiety values during the pandemic.

According to the results of some individual studies, a high prevalence of depressive symptoms, anxiety and stress were encountered during the pandemic (19). However, meta-analyses analysis of Ayubi et al. and Yu et al. showed lower anxiety in patients who encountered with Covid-19 (20, 21). The meta-analysis of Robinson et al. found an increase in mental health symptoms shortly after the pandemic, which then decreased (22). According to Pinkman et al., the impact of events related to COVID-19 on mental health may need time (23). Our study progressed with 3 questionnaires and, in agreement with the majority of the literature, anxiety increased in all who had Covid-19. During the pandemic process, both gender and age factors affected

the health-related behaviors and preferences of individuals. In the study of Yildirim et al. (24), and Moccia et al. (25) reported higher depression and anxiety levels in female patients. Of course, the population of this study was predominantly female, and the difference may be related to the fact that women are disadvantaged in terms of social freedom or carry a heavy burden in terms of domestic responsibilities. In the study conducted in numerical equality, Özdin et al. found the anxiety about the pandemic to be higher in women (26). Furthermore, elderly patients preferred to postpone their appointments for a while and stay at home. Zhao et al. showed that anxiety and mental disorders are more intense in areas where quarantine practices are in place (27). 302 patients participated in our survey, with a wide range of ages. 21.2% of the patients had a diagnosis of Covid-19, while 6.6% died from Covid-19. Twenty-one of the patients were receiving psychiatric medication. Merz et al. stated that sociodemographic characteristics of cancer patients, such as education and age, affect their anxiety levels more than disease-related characteristics, and stated that low education level is associated with high anxiety levels of cancer patients during the pandemic (28). But, according to our results, education, chronic illness, psychological drugs, and age did not affect anxiety scores.

The study of Hacimusalar et al. have shown that not only female gender but also carrying a chronic disease are risk factors for anxiety during the pandemic (29). Treatment processes, which are especially important for cancer patients, are negatively affected by their effects on anxiety (30, 31). Although uncertainties, such as the variable restrictions imposed by COVID-19, cause anxiety and fear for cancer patients, studies on its psychological effects for these patients are limited. Baffert et al. investigated COVID-related anxiety in cancer patients and found a reduction in anxiety levels after quarantine (32). A study by Sigorski et al., in his

study of 306 patients with breast cancer, reported that being under 65, female, and having breast cancer was associated with the highest levels of anxiety. It also reported that cancer-related anxiety was higher than COVID-related anxiety (33). In our study, cancer was diagnosed in 59.3% according to the affected regions: 20.1% endometrium, 47.5% breast, 18.4% ovary, 12.8% cervix, and 1.2% uterus. Cancer significantly affected STAI-1, STAI-2 C19S, and DT. Patients with cancer had 1.39-fold higher STAI-1 scores than those without cancer. Similarly, patients with cancer had 1.37 times higher STAI-2 than patients without cancer. In the analysis for C19S score, cancer had 1.41 times higher C19S than patients without cancer. For DT scores, this ratio was 1.65 times.

The STAI-1 scores of the patients who received CT were 1.16 times than the STAI-1 scores of the patients who had cancer but did not receive additional tx. STAI-1 scores of the patients who received RT were 1.13 times the STAI-1 scores of the patients who had cancer but did not receive additional tx is higher ($p < 0.001$). The STAI-1 scores of patients who received CT+RT were 1.18 times more elevated than the STAI-1 scores of patients who had cancer and did not receive additional tx. The STAI-2 scores of patients with cancer who received CT+RT treatment were 1.14 times higher than patients with cancer who did not receive treatment. RT and CT had no effects on STAI-2 scores. The C19S of cancer patients who received CT, RT, and CT+RT were higher than those who did not receive treatments. The C19S of the patients who received CT were 1.22 times than the C19S of the patients who had cancer but did not receive additional tx. C19S of patients who received LT+RT were 1.26 times higher than the C19S of patients who had cancer but did not receive additional tx.

The strongest aspect of this study is that it is a unique and the detailed survey to analyze the Covid-19 impact with anxiety change. It had

several limitations, especially due to the fact that it was research conducted during the pandemic. The most important limitation was that the study was conducted in only one hospital and did not include a control. It did not allow us to investigate changes in the pre-pandemic period, as it did not include baseline data before COVID-19. Although we added the groups that did not have covid-19, some patients had the disease without being diagnosed with covid-19 and we could not certain that issue. Second, the hospital where the study was conducted may differ from COVID-19 death rates around the world. Finally, we conducted the surveys in predetermined time periods and decisions can be affected by situational factors.

Conclusion

Cancer patients have been subject to a strong challenge in the care of mental health symptoms during the pandemic. According to our study, cancer patients were affected by this condition for anxiety, and therefore clinicians should remain vigilant for mood complications.

Author contributions

All the authors equally developed the concept and designed research; performed research and acquired data; analyzed data; interpreted data; wrote and reviewed the manuscript.

Conflict of Interest

The author declares no conflict of interest.

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How to cite?

Basarir FO, Arslanca SB, Hamurcu HD, Atalay F.
Survey Analysis of Anxiety in Gynecological
Cancer Patients in the SARS-CoV-2 Pandemic.
Ulutas Med J. 2022;8(4):127-134

DOI: 10.5455/umj.20221106083739