Original Article

Effect of Covid-19 Fear and Covid-19 Anxiety on Sleep Quality of Breast Cancer Patients

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Abstract

Background: Sleep quality is an important factor for breast cancer patients. The factors affecting sleep quality in breast cancer patients need to be known well. However, there is a gap in the studies investigating the effect of Covid-19 fear and Covid-19 anxiety on sleep quality of breast cancer patients.

Objective: This research was conducted to determine the effect of Covid-19 anxiety and fear of Covid-19 on sleep quality of breast cancer patients.

Methodology: The sample of the study was 303 breast cancer patients who admitted to a state hospital. Data were collected between February and March 2021 and a Patient Identification Form, COVID-19 Fear Scale, COVID-19 Anxiety Scale and Pittsburgh Sleep Quality Index were used for data collection. Data were collected via an online survey. SPSS 25.0 were used for data analysis.

Results: The mean age of the patients was 35±2.55 years, and the mean duration of diagnosis was 11±1.90 months. The means scores were 11.84±1.55 for Covid-19 Anxiety Scale, 26.03± 2.79 for Covid-19 Fear Scale, and 13.60 ± 3.99 for Pittsburgh Sleep Quality Index. Regression estimates shows that Covid-19 fear and Covid-19 anxiety are negatively affecting the sleep quality of breast cancer patients.

Conclusion: It was determined that Covid 19 Pandemic caused anxiety and fear among breast cancer patients, and this fear and anxiety is significantly negatively affecting sleep quality.

Key Words: Covid-19 Fear; Covid-19 Anxiety; Sleep Quality; Breast Cancer

Background: The coronavirus (Covid-19) epidemic emerged in Wuhan in December 2019, spread all over the world in a short time and caused the death of many people worldwide. It is known that some special groups have a higher risk in terms of Covid-19 during the ongoing pandemic (Nekhlyudov et al., 2020; Jindal et al., 2020). Cancer patients are also more susceptible to infections due to the malignancy itself and to treatment with immunosuppressive drugs, chemotherapy or surgery (Musche et al., 2020). It is stated that a significant portion of those who lost their lives due to Covid-19 are cancer patients, and the risk increases especially if surgery or chemotherapy were applied before they infected (Tsamakis et al., 2020). This is also a fact for breast cancer patients, which is one of the most common types of cancer worldwide. Breast cancer patients have to go to the hospital frequently, as they have to go for routine check-ups or continue treatments. Such obligations also increase the risk of contracting Covid-19 (Swainston et al., 2020). This increased risk may force breast cancer patients to stop or postpone their treatment (Cui et al., 2020). After all, important psychological symptoms may occur in breast cancer patients (Massicotte, Ivers & Sayard, 2021).

It is known that fear has an important place among the psychological symptoms experienced during Covid-19 pandemic. The mortality of Covid-19 and its effect on immunosuppressed individuals creates a great fear on cancer patients (Musche et al., 2020; Karacin et al., 2020). In a

recent study, it was reported that more than 90% of the patients experienced moderate and severe fear of Covid-19 (Guven et al., 2020). Fear is defined as an unpleasant emotional state triggered by the perception of threatening stimuli, and extraordinary situations such as pandemic (Sepúlveda-Plata et al., 2018). Unfortunately, fear has the potential to increase the disease hazardous effect and is directly related to the rate of transmission and mortality of Covid-19. When fear, which occurs against threatening events and is a defense mechanism, is disproportionate, it becomes harmful and increases anxiety (Pinto e al., 2020; Stanton et al., 2020; Tu et al., 2020; Deng et al., 2020; Harlianty et al., 2020).

Anxiety can be defined as a state of concern about a subjective situation that is uncertain or perhaps unlikely to occur at the moment and in the future. Studies have shown that the fear of COVID-19 and anxiety are related to each other (Salehi et al., 2020; Rodríguez-Hidalgo et al., 2020). In another study, it was determined that those with chronic diseases and those with worse health status experienced more anxiety in the COVID-19 pandemic (Malesza & Kaczmarek, 2021). It is stated that anxiety triggers physiological events and increases cortisol level and decreases immunity accordingly. In addition, anxiety increases the severity of many symptoms of cancer and negatively affects compliance with medical treatment (Deng et al., 2020; Liu et al., 2020).

Although it was reported that there are many factors that decrease sleep quality during the pandemic process; psychological symptoms such as fear and anxiety significantly decrease the quality of sleep; It has also been reported that poor sleep quality aggravates psychological symptoms (Stanton et al., 2020; Deng et al., 2020; Grey et al., 2020). Impaired sleep quality can both increase susceptibility to infections and disrupt recovery in case of infection by negatively effecting the patients' immunity (Deng et al., 2020; Xiao et al., 2020). For these reasons, it is extremely important to maintain sleep quality and to recognize the factors that affect sleep quality (Stanton et al., 2020). Covid-19-related problems increase the psychological symptoms which are already common among breast cancer patients, and this may decrease sleep quality (Cui et al., 2020; Massicotte et al., 2021; Sigorski et al., 2020).

In a study examining the sleep quality of breast cancer patients during the Covid-19 pandemic, it was determined that nearly half of the patients had poor sleep quality (Cui et al., 2020). This emerging situation has the potential negative effects on prognosis of the disease (Cui et al., 2020; Sigorski et al., 2020). Accordingly, it is of great importance to determine the effect of Covid-19 fear and anxiety levels experienced by breast cancer patients on sleep quality. There was a gap in the literature in this respect. This study was conducted with the aim to examine the effect of Covid-19 anxiety and fear on sleep quality of breast cancer patients.

Study Questions: 1. What are the levels of Covid-19 fear, Covid-19 anxiety and sleep quality of breast cancer patients?
2. Does Covid-19 fear and Covid-19 anxiety affect the sleep quality of breast cancer patients?
Methodology: The study was of a descriptive design and conducted at a state hospital between February and March 2021. The population of the study consisted of patients who diagnosed with breast cancer and admitted to a state hospital. The sample size of the study was calculated using power analysis; with a significance level of 0.05, an effect size of 0.48, and 0.79 power, it was determined that the required sample size should be 303. Three-hundred-three patients aged 18 and over, able to use social networks and volunteering to participate in the study were included in the study.
Data were collected via online survey systems due to the ongoing pandemic during the study period and no face-to-face interviews were used to collect data Fear of Covid-19 Scale (FCV-19S), Coronavirus Anxiety Scale (CAS), and Pittsburgh Sleep Quality Index (PSQI) were used for data collection.
Fear of Covid-19 Scale (FCV-19S): The Fear of COVID-19 Scale, developed by Ahorsu et al. (2020), was adapted into Turkish by Satıcı et al. (2020). The applicable age scale of the scale is wide and it can be used on university students and adults. There isn't any reversed item in the scale. The questions were scored between 1-5 (1-Strongly disagree… 5-Strongly agree) using a 5-point Likert type scaling. Total scores range between 7-35 in this scale. High scores show the high level of fear of Covid-19. In the Turkish validity and reliability study of the scale, the Cronbach's Alpha value was reported 0.82 (Ahorsu et al., 2020; Satici et al., 2020). In this

study, the Cronbach Alpha value of the scale was determined as 0.91.

Coronavirus Anxiety Scale (CAS): Developed by Lee et al. to measure the anxiety levels of individuals during the Covid-19 pandemic process ($\alpha = 0.93$). Evren et al. were evaluated the Turkish validity and reliability of the scale and reported it as a valid and reliable tool for Turkish society. Participants answered the five questions in the scale, how often they have lived in the last 2 weeks, with the options "Not at all", " Rare, less than a day or two ", " Several days ", " More than 7 days " and "Nearly every day over the last 2 weeks". The lowest point is 0 and the highest is 4 for each item. Thus, total point of scale range between 0 and 20. Higher points shows higher level of coronavirus-related anxiety (Lee, 2020; Evren et al., 2020). In the current study, the Chronbach's Alpha value of the scale was 0.95.

Pittsburgh Sleep Quality Index (PSQI): PSQI was developed by Buysse et al. (1989) and adapted to Turkish society by Ağargün et al. (1996). The PSQI is a 19-item self-report scale that assesses sleep quality and disorder over the past month. It consists of 24 questions, 19 questions are self-report questions, 5 questions are answered by the spouse or roommate. Only 18 item of the scale is including the scoring and the scale consist of 7 components; subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. Each item is weighted on a 0–3 interval scale. The global PSQI score is then calculated by totaling the seven component scores, providing an overall score ranging from 0 to 21, where lower scores denote a healthier sleep quality. The scores over 5 show "bad sleep quality". The Chronbach's Alpha value of the scale was reported as 0.80 (Buysse et al., 1989).

Data Analysis: SPSS 25.0 package program software was used for data analysis. Kolmogorov-Smirnov test were used to determine the normal distribution of data or not. Number, percentage distributions, mean and standard deviation were used to evaluate the socio-demographic data and scale scores of the patients. Pearson's correlation analysis was performed to examine the relationship between scale total points. By using the multivariate linear regression model, the predictive status of anxiety and fear levels of the patients on sleep quality was examined. The significance level was accepted as $p < 0.05$.

Ethics: This research was conducted in accordance with the principles of the Declaration of Helsinki, after obtaining Ethics committee approval (date; 18.01.2021 Protocol number 2021-19/3) and institutional permission. At the beginning of the questionnaire which sent to the participants, there was information about the purpose and content of the study and that participation in the study was voluntary. The identity information of the participants was not recorded in the questionnaire.

Results

It was found that the mean age of the patients was 35 ± 2.55 years, and the mean duration of diagnosis was 11 ± 1.90 months. Most of the patients were married (70.3%), graduated from secondary education (51.2%), did not work (34.0%), did not have metastasis (76.0%), were in histopathological stage II (59.1%), underwent operation (72.0%), received chemotherapy treatment (63.7%), didn't get Covid-19 (71.3%) and no family history of Covid-19 (56.4%) Table 1). When we evaluate the frequency of "strongly agree" option for the items of Covid-19 scale; It was determined that the highest rate was " When I watch news and stories about Corona on social media, I become nervous or anxious " (67.3%), and the lowest rate is " My heart races or palpitates when I think about getting Corona." (22.8%). When we evaluate the frequency of "Nearly every day over the last 2 weeks" option for the items of Coronavirus Anxiety Scale; " I had trouble falling or staying asleep because I was thinking about the coronavirus" (39.3%), which is the second item of the largest rate, and the least amount was the 3rd item, "I felt paralyzed or frozen when I thought about or was exposed to information about the coronavirus" (27.7%).

The mean CAS score of the patients was 11.84 ± 1.55, the mean FCV-19S score was 26.03 ± 2.79 and the mean PSQI score was 13.60 ± 3.99. A moderate statistically significant positive correlation was found between the CAS total score of the patients and the FCV-19S total score ($r = 0.551$, $p = 0.020$). A high significant positive correlation was found between the CAS ($r = 0.723$, $p = 0.011$) and FCV-19S ($r = 0.817$, $p = 0.025$) patients' PSQI total scores. Three regression models were created according to the variables. Multiple regression analysis was used

to evaluate the models. In the first model, the CAS level of the patients was included in the total mean score. This variable explains 23.1% of the sleep quality of the patients. In this model, a statistically significant positive correlation was found between the anxiety level of the patients and their sleep quality (β= 0.387). The second model includes the patients' FCV-19S score average. These variables explain 43.5% of the sleep quality of the patients. In this model, a statistically significant positive correlation was found between the patients' fears and sleep quality (β= 0.639). The third model includes the CAS and FCV-19S level total score average of the patients. These variables explain 55.9% of the sleep quality of the patients (Table 5, Figure 1).

Table 1. Distribution of descriptive demographics of patients.

	Mean±SD	Min-Max
Age (years)	35±2.55	21-54
Disease duration (months)	11±1.90	6-20
	n	**%**
Marital Status		
Married	213	70.3
Single	90	29.7
Education Level		
Primary school	67	22.1
Secondary school	155	51.2
Bachelor's degree or higher	81	26.7
Profession		
Not working	103	34.0
Officer	95	31.3
Laborer	55	18.2
Self-employment	50	16.5
Metastazis		
Yes	73	24.0
No	230	76.0
Histopathological Stage		
Stage I	63	20.8
Stage II	179	59.1
Stage III	61	20.1
Operated (cancer-related)		
Yes	218	72.0
No	85	28.0
Treatment (current)		
Chemotherapy	193	63.7
Radiotherapy	71	23.4
Combined	39	12.9
Covid-19 infected (current or past)		
Yes	87	28.7
No	216	71.3
Family history of Covid-19 infection		
Yes	132	43.6
No	171	56.4

Table 2. Distribution of the patients' responses to FCV-19S

	Strongly disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	X±SD
1. I am most afraid of Corona	0(0)	7(2.3)	19(6.3)	75(24.7)	202(66.7)	4.1±0.24
2. It makes me uncomfortable to think about Corona	0(0)	5(1.6)	30(9.9)	149(49.2)	119(39.3)	4.0±0.61
3. My hands become clammy when I think about Corona	0(0)	22(7.3)	94(31.0)	105(34.6)	82(27.1)	3.3±0.75
4. I am afraid of losing my life because of Corona	0(0)	20(6.6)	41(13.5)	53(17.5)	189(62.4)	4.2±0.99
5. When I watch news and stories about Corona on social media, I become nervous or anxious	5(1.7)	8(2.6)	16(5.3)	70(23.1)	204(67.3)	4.7±0.53
6. I cannot sleep because I'm worrying about getting Corona.	0(0)	0(0)	81(26.8)	121(39.9)	101(33.3)	3.2±0.16
7. My heart races or palpitates when I think about getting Corona.	0(0)	66(21.8)	73(24.1)	95(31.3)	69(22.8)	3.1±0.72
Total					**X±SD**	
					26.03±2.79	

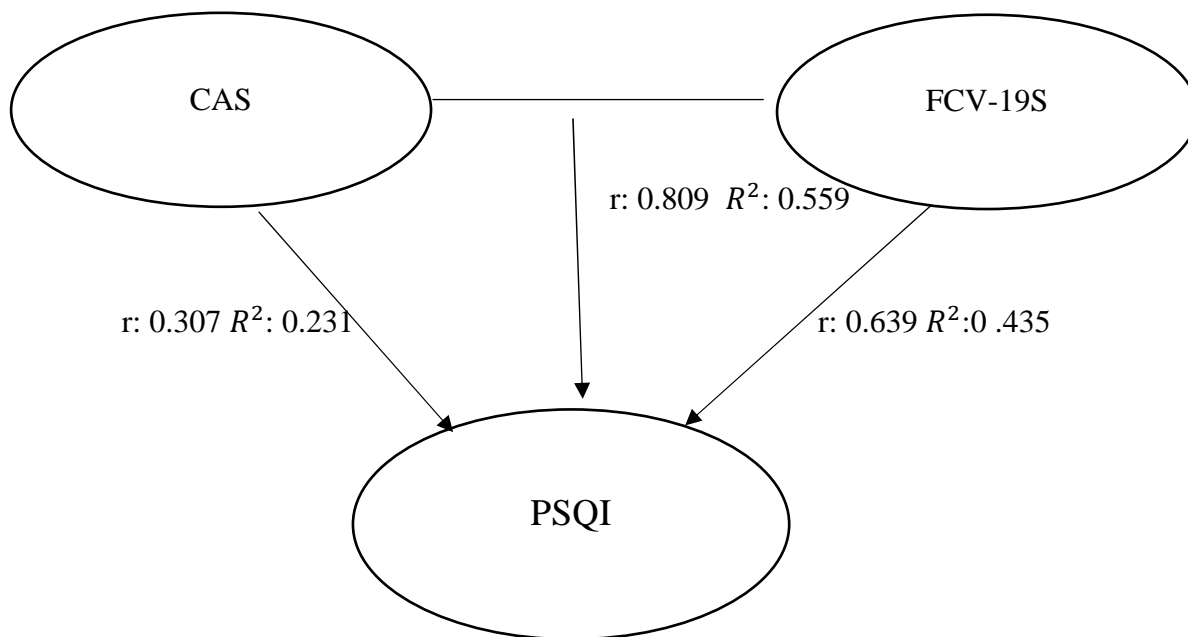### Table 3. Distribution of the patients' responses to CAS

	Not at all n (%)	Rare, less than a day or two n (%)	Several days 3 n (%)	More than 7 days 4 n (%)	Nearly every day over the last 2 weeks 5 n (%)	X±SD
I felt dizzy, lightheaded, or faint when I read or listened to news about the coronavirus	0 (0)	24 (7.9)	78(25.7)	95(31.4)	106(35.0)	2.7±0.53
I had trouble falling or staying asleep because I was thinking about the coronavirus	0(0)	15(5.0)	65(21.4)	104(34.3)	119(39.3)	3.5±0.06
I felt paralyzed or frozen when I thought about or was exposed to information about the coronavirus	3(1.0)	19(6.3)	73(24.1)	124(40.9)	84(27.7)	1.4±0.80
I lost interest in eating when I thought about or was exposed to information about the coronavirus	7(2.3)	32(10.6)	70(23.1)	100(33.0)	94(31.0)	2.3±0.41
I felt nauseous or had stomach problems when I thought about or was exposed to information about the coronavirus	0(0)	11(3.6)	56(18.5)	135(44.6)	101(33.3)	2.5±0.27
					X±SD	
Toplam					26.03±2.79	

Table 4. Correlations between CAS, FCV-19S, and PSQI

		CAS	FCV-19S	PSQI
CAS	**r**	-	**-**	**-**
	p			
FCV-19S	**r**	0.551	-	-
	p	**0.020**		
PSQI	**r**	**0.723**	**0.817**	-
	p	**0.011***	**0.025***	

	β	p
Predicting Factors - Dependent Variable		
CAS- PSQI	0.307	.001*
Adjusted R2: .231, F: 12.513, β: .387*, %95 CI [1.12,0.31]		
FCV-19S - PSQI	**0.639**	**000***
Adjusted R2: .435, F: .470, β: .639, %95 CI [2.79, 1.75]		
CAS and FCV-19S - PSQI	0.809	**000***
Adjusted R2: .559, F: 19.061, CAS β: .407*, %95 CI [1.09, 0.45],FCV-19S β: .613*, %95 CI [15.21, 8.70]		

Figure 1. Regression Models

r: 0.809 R^2: 0.559

r: 0.307 R^2: 0.231

r: 0.639 R^2:0 .435

Discussion: This study was conducted with patients diagnosed with breast cancer and undergoing chemotherapy or surgery. The effect of Covid-19 fear and Covid-19 anxiety on sleep quality was examined.

In this study, it was determined that the mean FCV-19S score of the patients was 26.03 ± 2.79. Considering that the highest score obtained from the scale is 35, it can be said that patients with breast cancer experience high levels of fear of Covid-19. When the literature is investigated,

there is a gap in studies examining the fear of Covid-19 in patients with breast cancer. Considering the studies conducted in cancer patients, it was reported that the patients' fear level of Covid-19 is high (Musche et al., 2020; Guven et al., 2020; Ng et al., 2020). In this study, it was found that the majority of the patients choose the "I strongly agree" for the item 5 "When I watch news and stories about Corona on social media, I become nervous or anxious." This result shows that exposure to negative news is one of the most contributing factors that increase fear. In addition, difficulties in accessing hospital resources, concern for infection, socio-economic factors, etc. It is stated that many factors significantly affect the fear of Covid-19 (Hossain et al., 2020).

In the current study, it was found that the CAS score of the patients is 11.84 ± 1.55 out of 20. When studies investigating Covid-19 anxiety in breast cancer patients are examined; It has been found that patients experience high level of anxiety (Cui et al., 2020; Massicotte, Ivers & Sayard, 2021; Sigorski et al., 2020). In a study conducted with oncology patients, it was determined that the oncology patients experienced a higher level of anxiety than the non-oncological control group (Musche et al., 2020). The result of our research is similar to the literature. It has been stated that anxiety poses a great risk in terms of worsening the medical condition, and patients with high level of anxiety experience serious problems in their compliance with treatment and diagnostic procedures (Karacin et al., 2020). However, it is emphasized that anxiety impairs sleep quality and is an important predictor of depressive symptoms (Cui et al., 2020; Stankoyska, Memedi & Dimitrovski, 2020; Peteet 2020). Covid-19 and related factors are reported to increase anxiety in patients with breast cancer (Karacin et al., 2020). In addition, it is thought that exposure of patients to news stating that individuals with chronic diseases have a higher mortality rate is one of the important factors that increase anxiety (Karacin et al., 2020). I this study, it was determined that 35% of the patients answered the item " I felt dizzy, lightheaded, or faint when I read or listened to news about the coronavirus " almost every day in the last 2 weeks.

A score greater than 5 in the PSQI indicates poor sleep quality. In this study, it was determined that the sleep quality of the patients was at poor level.

In the studies conducted with patients with breast cancer during the Covid-19 pandemic, it was reported that approximately half of the patients showed symptoms of insomnia (Cui et al., 2020; Massicotte et al., 2021). It is emphasized that stressors exposed during the lock-in process are loneliness, economic difficulties, anxiety about getting an infection, problems in accessing health services, being constantly exposed to death news, etc. It is known that sleep quality is very important for coping with stress and strengthening the immune system against infections (Becker, 2020; Léger et al., 2020). It was stated that coping with sleep problems by exercising and avoiding screen time can be useful, as well as seeking pharmacological support should be considered (Sateia et al., 2017).

A positive correlation was found between the CAS total score and the FCV-19S total score which means decrease in sleep quality. Studies examining the relationship between Covid-19 fear and Covid-19 anxiety were also reported similar findings (Salehi et al., 2020; Rodríguez-Hidalgo et al., 2020). It was stated in the literature that there is a positive relationship between fear and anxiety. This finding of the study also supports this phenomenon.

It was found that as the CAS total score of the patients increased, the PSQI total score also increased. In fact, it was determined that the vast majority of the patients marked the option almost every day in the last 2 weeks to the item "I had trouble falling asleep or staying asleep because I thought about the coronavirus" from the items of the Covid-19 anxiety scale. According to the regression analysis; we found that this variable explained 23.1% of the sleep quality of the patients. Similar to the results of current study, other studies have found that high anxiety levels decrease sleep quality (Becker, 2020; Stojanov et al., 2020; Ernstsen & Havnen 2021).

Increased anxiety disrupts sleep quality by causing difficulty in falling asleep and frequent waking up during sleep (Porcelli, 2020). In addition, it has been reported that the relationship between anxiety and sleep is bidirectional, and sleep disturbances lead to severe anxiety symptoms (Rajkumar, 2021). Therefore, it is of great importance for breast cancer patients who have sleep problems to consult psychosocial support systems.

In the current study, it was determined that as the fear of Covid-19 increased, the sleep quality of the patients decreased. Similar results were reported in a study by Lin et al. (Lin et al., 2020). It was determined that fear of Covid-19 explains 43.5% of patients' sleep quality. It has been stated that sleep disturbances are an important risk factor for psychological problems, so the treatment of sleep disorders is vital (Sher, 2020).

When the effects of anxiety and fear together on sleep quality were examined, it was determined that they were predictors explaining 55.9% of sleep quality. Sleep quality is necessary for the protection of psychophysiological health, but it is known that sleep problems are common among cancer patients and this increases mortality (Strollo et al., 2020). Sleep disorders; Although it can be affected by many factors such as fatigue, age, gender, etc. (Fang et al., 2019), in this study, it was found that Covid-19 anxiety and Covid-19 fear had a significant effect on sleep quality. In this respect, while examining sleep problems, such psychological symptoms should be examined.

Conclusion: As a result, it was determined that the Covid-19 Pandemic caused anxiety and fear in breast cancer patients who are also in the high-risk group for Covid-19, and this situation significantly negatively affected their sleep quality. Interventions should be planned considering that psychological symptoms and sleep problems that may arise from the Covid-19 pandemic in patients with breast cancer cause physiological consequences. Determining the variables affecting the sleep quality of the patients, evaluating them in terms of anxiety and fear, and providing consultations based on telehealth, internet and application are recommended. More studies are needed in this respect.

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