

The Effect of Fear of COVID-19 on Women's Beliefs about Breast Cancer Screening: A Cross-Sectional Study

Kadınların COVID-19 Korkusunun Meme Kanseri Taramalarına Yönelik İnançlarına Etkisi: Kesitsel Bir Çalışma

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ABSTRACT

Objective: The aim of this study is to investigate the effect of fear of COVID-19 on women's beliefs about breast cancer screening.

Methods: This cross-sectional study was carried out with 389 women between 40 and 69, the age range for screening in Turkey. The study sample was selected from women attending the Public Education Center and in the courses in this center. Data were collected using the The Personal Data Identification Form, the Fear of COVID-19 Scale, and the Champion's Health Belief Model Scale in Breast Cancer Screening. The scales were administered between 15 May 2022 and 15 June 2022.

Results: It was revealed that 69.4% of the women did not have regular mammography, and 34.7% postponed the screening due to the pandemic. It was found that the fear of COVID-19 had a significant effect on the susceptibility ($p<0.001$) and severity ($p<0.001$) dimensions of the Health Belief Model Scale in Breast Cancer Screening. It was revealed that a one-unit increase in fear of COVID-19 caused a 0.087-unit increase in the susceptibility dimension ($p<0.001$) and a 0.301-unit increase in the severity dimension ($p<0.001$).

Conclusion: The study revealed that the fear of COVID-19 did not negatively affect women's beliefs about breast cancer screening. In order to regain the pre-pandemic momentum in breast cancer screening practices, women should be motivated with trainings on the importance of screening.

Keywords: Breast cancer, COVID-19, fear, public health, women

Öz

Amaç: Bu çalışmanın amacı COVID-19 korkusunun kadınların meme kanseri taramalarına yönelik inançlarına etkisinin araştırılmasıdır.

Yöntem: Kesitsel tipteki bu çalışma ülkemizde tarama yaşı olan 40-69 yaş arasındaki 389 kadın ile gerçekleştirildi. Çalışma örneklemi Halk Eğitim Merkezi ve bu merkeze bağlı kurslara katılan kadınlardan seçildi. Veriler kişisel veri tanımlama formu, COVID-19 korkusu ölçeği ve meme kanseri taramalarında champion sağlık inanç modeli ölçeği ile toplandı. Ölçekler 15 Mayıs 2022- 15 Haziran 2022 tarihleri arasında uygulandı.

Bulgular: Kadınların %69,4'ünün düzenli mamografi yaptırmadığı, %34,7'sinin ise COVID-19 pandemisi nedeniyle tarama zamanı gelmesine rağmen taramayı ertelediği belirlendi. COVID-19 korkusunun duyarlılık ($p<0,001$) ve ciddiyet ($p<0,001$) boyutlarında etkisinin anlamlı olduğu bulundu. COVID-19 korkusundaki bir birimlik artış duyarlılık boyutunda ($p<0,001$) 0,087 birimlik, ciddiyet boyutunda ($p<0,001$) ise 0,301 birimlik artışa neden olduğu tespit edildi.

Sonuç: COVID-19 korkusu kadınların meme kanseri taramalarına yönelik inançlarını olumsuz etkilememiştir. Meme kanseri taramalarında pandemi öncesi ivmenin tekrar kazanılması için bu konuda verilecek eğitimler ile kadınlar güdülenmelidir.

Anahtar kelimeler: Meme kanseri, COVID-19, korku, halk sağlığı, kadınlar

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INTRODUCTION

The COVID-19 pandemic has affected every aspect of daily life. The way people worked, lived, did shopping, and socialized changed. People's future plans were affected ⁽¹⁾ and radical changes occurred in their way of life. These changes are reported to cause increased psychological distress associated with the pandemic, including fear, anxiety, perceived threat, and stress ⁽²⁾. It is stated that more than half of the people reported fear and anxiety during the pandemic in China ⁽³⁾. It has been determined that individuals postponed their general health screening or check-ups due to this fear. A study conducted in Brazil found a dramatic decrease in the preventive and therapeutic services provided to the Brazilian population ⁽⁴⁾. It has been observed that non-urgent care and elective surgeries were canceled in many countries during the pandemic, and basic services in hospitals generally included emergency consultations, necessary treatments. Routine public health activities, including cancer screening practices were also affected in many countries. It has been reported that some countries, temporarily postponed some programs ⁽⁵⁾. Cancer screening services continued in Turkey with a significant decrease in applications for screening. It was reported that breast cancer screening practices decreased by 78.5% ⁽⁶⁾. It seems that both the health policies of the countries for the continuation of preventive services and the reservations of individuals due to the increase in COVID-19 cases had a negative impact on cancer screening. A modeling study estimated an approximately 7.9-9.6% increase in the number of breast cancer-related deaths up to 5 years after diagnosis as a result of pandemic-related disruptions in diagnosis and treatment ⁽⁷⁾.

Breast cancer is common in women. There were 2.3 million women diagnosed with breast cancer and 685,000 deaths due to breast cancer worldwide in 2020 ⁽⁸⁾. Screening programs play a key role in asymptomatic detection ⁽⁹⁾. Women who have regular screening are reported to have a 49% lower risk of mortality and a 50% lower risk of death within 10 years after diagnosis than those who do not ⁽¹⁰⁾. Health beliefs play an important role in directing individuals to preventive health behaviors such as breast cancer screening ⁽¹¹⁾. A widely used model focusing on people's beliefs is the Health Belief Model (HBM). According to this model, the motivation to protect health is a result of the perceived costs and

benefits of taking precautions by thinking ahead, as well as the desire to avoid the perceived risk and possible negative consequences. Perception of risk or threat is related to an individual's experience and understanding of risk ⁽¹²⁾. The fear of COVID-19 may have changed the beliefs and behaviors about breast cancer by affecting the perceived susceptibility, perceived severity, perceived benefit, and perceived barriers, which are the components of the HBM and by changing the understanding of risk. In the literature review, no studies were found on the relationship between fear of COVID-19 and health beliefs in breast cancer screening practices. Therefore, this study aimed to investigate the effect of fear of COVID-19 on women's beliefs about breast cancer screening.

METHOD

Research population and sample

This cross-sectional study target population of the research consisted of women between the ages of 40-69 living in the center of Afyonkarahisar province of Turkey. Women between these ages are the target group for the breast cancer population-based screening program in Turkey. The study employed a sampling procedure due to time, cost and accessibility constraints. In this context, the simple sampling method was adopted, taking into account the representation of the target population, reduction of the sampling error, and sociodemographic factors such as age, marital status, and educational status. The purpose of the simple sampling method is to include everyone who agrees to participate in the study. The process of recruitment of subjects continues until the target sample size is reached ⁽¹³⁾. In the present study, the $n = s^2 \cdot z^2 / d^2$ formula recommended for quantitative studies and infinite populations ($N > 10\ 000$) was used to calculate the minimum sample size ⁽¹⁴⁾. The number of samples was calculated as 384. The study was carried out with 420 women between the ages of 40-69 who attended the Public Education Center and took part in the courses in this center. Data from 389 women were analyzed due to missing and erroneous data.

Procedure

Before collecting data, the participants were informed. Those who gave consent to take part in the study were asked to fill out the scales. It took about 15 minutes for the participants to fill out each scale.

Data collection method

In this study, data were collected using the Personal Data Identification Form, the Champion's Health Belief Model Scale in Breast Cancer Screening (HBMBCS), and the Fear of COVID-19 Scale. The scales were administered between 15 May 2022 and 15 June 2022.

The personal data identification form

The form prepared by the researchers included questions aimed at determining the socio-demographic characteristics of participants.

Champion's health belief model scale in breast cancer screening

The scale, developed by Victoria Champion in 1984, consists of sub-dimensions related to the concepts discussed in the Health Belief Model. Gözümlü and Aydın (2004) ⁽¹⁵⁾ performed the Turkish validity and reliability study. The scale consists of 52 items under 8 sub-dimensions. The scale is a five-point Likert type. Higher scores indicate a higher perception of susceptibility, benefits, and barriers. In the present study, the sub-dimensions of susceptibility, severity, health motivation, perceived benefits of mammography, and perceived barriers to mammography were used. The Cronbach's alpha were calculated as 0.83, 0.85, 0.84, 0.80 and 0.89 respectively in this study.

The fear of COVID-19 scale

Ahorsu et al. (2020) ⁽¹⁶⁾ developed this scale to assess the COVID-19-induced fear levels of individuals. Ladikli et al. (2020) ⁽¹⁷⁾ performed the Turkish validity and reliability study. The scale consists of seven items on a five-point Likert-type scale and has a single factor structure. The Cronbach's alpha was calculated 0.87 in this study. The total scale score ranges from 7-35. Higher scores indicate higher levels of COVID-19 fear.

Ethical approval

Ethical approval (Date/number: 13.05.2022/6) was obtained from the Ethics Committee of a university, and informed consent was obtained from the participants.

Data analysis

Statistical analysis was performed using the IBM SPSS Statistics for Windows, Version 25.0. Frequency and percentage values were calculated to see the distribution of the participants according to their individual characteristics. In addition, descriptive statistics for each scale was given with arithmetic

mean and standard deviation values. COVID-19 fear levels and HBMBCS sub-dimensions were compared using t-test and One Way ANOVA according to some individual characteristics. The effect of fear of COVID-19 on health beliefs regarding breast cancer screening practices was revealed with the simple linear regression analysis. The level of statistical significance was set at $p < 0.05$ in all analyses.

RESULTS

The mean age of the participants was 50.11. 88.7% were married, 11.3% were single. 6.2% of the participants were illiterate, 37.5% graduated from primary school, while 14.1% finished secondary school. 25.2% were high school and 19% were university graduates. 16.2% of the participants stated that they had a problem in their breast. In addition, 16.2% had a family history of breast cancer. It was found that 69.4% did not have regular mammography, and 40.4% received training on breast cancer. It was determined that 51.4% contracted COVID-19, 26.7% lost a relative due to COVID-19, and 34.7% postponed screening due to the pandemic (Table 1). The mean Fear of COVID-19 Scale score was 19.12 ± 5.97 and it was determined to be below the median value of 21.

The Fear of COVID-19 Scale score and the scores for the susceptibility, severity, health motivation, perceived benefits of mammography, and perceived barriers to mammography sub-dimensions of the HBMBCS Scale were compared according to some personal characteristics (Table 1). It was found that marital status did not affect the HBMBCS Scale scores. It was revealed that perceived barriers to mammography scores differed according to the level of education. The scores of illiterate women in this dimension were higher than those of university graduates ($p = 0.001$). It was also found that the susceptibility scores of the women who had breast-related problems before were higher than those who had no problems at all ($p = 0.008$). In addition, the perceived barriers to mammography scores of the women who did not have any breast problems were higher than those who had problems ($p = 0.001$). The susceptibility ($p < 0.001$) and severity ($p = 0.025$) scores of the participants with a family history of breast cancer were found to be higher than those of the participants without a breast cancer family history. The perceived barriers to mammography scores of the participants who did not have regular mammography were higher than those of the participants who had regular mammography

Table 1. The fear of COVID-19 scale score and the scores for the susceptibility, severity, health motivation, perceived benefits of mammography, and perceived barriers to mammography sub-dimensions of the HBMBCS scale were compared according to some personal characteristics

Fear of COVID-19			HBMBCS					
			Susceptibility	Severity	Health Motivation	Mammography benefits	Mammography barriers	
Variable	Group	n/%	$\bar{X} \pm SD$	$\bar{X} \pm SD$	$\bar{X} \pm SD$	$\bar{X} \pm SD$	$\bar{X} \pm SD$	$\bar{X} \pm SD$
Marital status	Married	345/88.7	19.12 ± 5.97	7.77 ± 2.57	19.53 ± 5.28	20.09 ± 3.7	18.72 ± 3.46	27.47 ± 8.81
	Single	44/11.3	19.14 ± 6.02	7.11 ± 2.85	18.09 ± 5.14	20.25 ± 2.49	19.05 ± 3.27	28.48 ± 7.95
	P/t		0.983/-0.021	0.114/1.586	0.089/1.704	0.784/-0.274	0.561/-0.582	0.471/-0.722
Educational status	Illiterate	24/6.2	20.88 ± 5.02	7.21 ± 2.5	18.21 ± 4.37	18.71 ± 2.66	18.04 ± 2.27	33.5 ^a ± 7.01
	Primary school	146/37.5	19.33 ± 5.98	7.88 ± 2.71	19.25 ± 5.53	19.99 ± 3.31	18.92 ± 3.22	27.87 ^{ab} ± 8.96
	Secondary school	47/14.1	19.51 ± 5.9	7.55 ± 2.33	19.77 ± 5.59	19.85 ± 3.84	18.3 ± 4.15	29.15 ^b ± 8
	High school	98/25.2	18.94 ± 6.35	7.42 ± 2.78	19.33 ± 5.34	20.16 ± 3.99	18.37 ± 4.08	26.48 ^{ab} ± 8.7
	University	74/19.0	18.12 ± 5.71	7.96 ± 2.34	19.77 ± 4.82	20.91 ± 3.54	19.5 ± 2.54	25.57 ^c ± 8.28
P/F		0.330/0.155	0.464/0.900	0.749/0.482	0.100/1.960	0.140/1.741	0.001/4.748	
Had breast-related problems	Yes	63/16.2	19.44 ± 6.45	8.49 ± 3.21	19.17 ± 6.09	20.08 ± 4.43	19.22 ± 3.71	24.17 ± 8.33
	No	326/83.8	19.06 ± 5.88	7.55 ± 2.45	19.4 ± 5.12	20.12 ± 3.4	18.67 ± 3.38	28.24 ± 8.64
	P/t		0.636/0.473	0.008/2.658	0.755/-0.312	0.940/-0.075	0.245/1.164	0.001/-3.440
Family history	Yes	63/16.2	19.25 ± 6.6	9.37 ± 2.58	20.73 ± 5.73	20.84 ± 3.58	19.35 ± 2.46	28.17 ± 9.11
	No	326/83.8	19.09 ± 5.85	7.38 ± 2.49	19.1 ± 5.16	19.97 ± 3.57	18.65 ± 3.59	27.47 ± 8.64
	P/t		0.844/0.197	<0.001/5.767	0.025/2.253	0.077/1.773	0.138/1.486	0.557/0.588
Regular mammography	Yes	119/30.6	18.76 ± 6.34	7.87 ± 2.92	19.97 ± 5.14	20.52 ± 4.28	19.33 ± 3.56	25.23 ± 8.99
	No	270/69.4	19.28 ± 5.81	7.62 ± 2.46	19.1 ± 5.33	19.93 ± 3.22	18.51 ± 3.36	28.62 ± 8.39
	P/t		0.428/-0.793	0.381/0.877	0.131/1.514	0.134/1.503	0.031/2.169	<0.001/-3.597
Receiving training about breast cancer	Yes	157/40.4	19.15 ± 5.9	7.81 ± 2.57	20.59 ± 5.19	20.41 ± 3.77	18.69 ± 3.49	28.1 ± 8.91
	No	232/59.6	19.09 ± 6.03	7.63 ± 2.63	18.53 ± 5.19	19.91 ± 3.45	18.81 ± 3.41	27.24 ± 8.58
	P/t		0.925/0.094	0.495/0.682	<0.001/3.837	0.170/1.376	0.754/-0.314	0.341/0.954
Having contracted COVID-19	Yes	200/51.4	19.35 ± 5.97	7.78 ± 2.51	20.05 ± 5.41	20.29 ± 3.68	18.69 ± 3.43	27.46 ± 8.02
	No	189/48.6	18.87 ± 5.98	7.62 ± 2.71	18.65 ± 5.05	19.93 ± 3.48	18.84 ± 3.46	27.72 ± 9.41
	P/t		0.432/0.787	0.556/0.589	0.009/2.632	0.324/0.988	0.676/-0.418	0.765/-0.299
Lost a relative due to COVID-19	Yes	104/26.7	20.68 ± 5.73	7.94 ± 2.75	20.43 ± 5.21	20.66 ± 2.8	19.11 ± 2.75	29.44 ± 8.99
	No	285/73.3	18.55 ± 5.97	7.61 ± 2.55	18.98 ± 5.26	19.91 ± 3.81	18.64 ± 3.65	26.91 ± 8.52
	P/t		0.002/3.157	0.267/1.111	0.016/2.424	0.066/1.844	0.233/1.196	0.011/2.560
Having delayed screening due to COVID-19	Yes	135/34.7	19.47 ± 5.62	8.01 ± 2.78	20.27 ± 5.11	20.43 ± 3.87	19.39 ± 3.06	27.1 ± 8.7
	No	254/65.3	18.93 ± 6.15	7.53 ± 2.5	18.89 ± 5.32	19.94 ± 3.41	18.43 ± 3.58	27.84 ± 8.72
	P/t		0.402/0.839	0.082/1.746	0.014/2.471	0.201/1.282	0.008/2.662	0.422/-0.804

^{a,b,c} Means of groups followed by different letters differ; HBMBCS: Health Belief Model Scale in Breast Cancer Screening

Table 2. Simple linear regression analysis results showing the effect of fear of COVID 19 on the perception of susceptibility and severity

		B(%95 CI)	Beta	t	p
Susceptibility	Constant	6.033 (5.177 - 6.889)	0	13.856	<0.001
	Fear of COVID-19	0.087 (0.044 - 0.13)	0.200	4.009	<0.001
B: Non-standardized coefficient, Beta: standardized coefficient, F=16.072, p<0.001, Adj R ² =0.037, SE: 2.557					
Severity	Constant	13.609 (11.945 - 15.273)	0	16.076	<0.001
	Fear of COVID-19	0.301 (0.218 - 0.384)	0.34	7.123	<0.001

B: Non-standardized coefficient, Beta: standardized coefficient, F=50.732, p<0.001, Adj R²=0.114, SE: 4.972

(p<0.001). The severity scores of the participants who received training on breast cancer were found to be higher than those who did not receive training (p<0.001). Similarly, the severity scores of the participants who contracted COVID-19 were found to be higher than those who did not have the disease (p=0.009). The study revealed no significant relationship between fear of COVID-19 and the variables of marital status, educational status, problems in the breast, family history, having regular mammography, receiving training about breast cancer, having contracted COVID-19, and having delayed screening due to COVID-19 (p>0.05). However, the fear of COVID-19 (p=0.002), severity (p=0.016), and perceived barriers to mammography (p=0.011) scores of the participants who lost a relative due to COVID-19 were higher than those of the participants who did not lose a relative due to COVID-19.

The results of the simple linear regression analysis performed to determine the effect of fear of COVID-19 on the susceptibility, severity, health motivation, perceived benefits of mammography, and perceived barriers to mammography sub-dimensions of the HBMBSC Scale are given in Table 2. As seen in the table, the fear of COVID-19 had a significant effect only on susceptibility (p<0.001) and severity (p<0.001) dimensions. A one-unit increase in fear of COVID-19 caused a 0.087-unit increase in the susceptibility sub-dimension (p<0.001) and a 0.301-unit increase in the severity sub-dimension (p<0.001). Fear of COVID-19 explained 3.7% of the susceptibility scores and 11.4% of the severity scores of the participants.

DISCUSSION

It is known that during the COVID-19 pandemic, many women did not have breast cancer screening although it was time for them to have a check-

up. According to the HBM health behavior is determined by an individual's personal beliefs or perceptions about a disease or health condition. Susceptibility, severity, benefits, barriers, and self-efficacy perceived by an individual for a problem may significantly affect the behavior the individual can exhibit⁽¹⁸⁾. We believe that the fear of COVID-19 experienced by women may have changed their perceptions of susceptibility, severity, barrier, and benefit, thus disrupting their screening practices. Therefore, in this study, we aimed to investigate the effect of fear of COVID-19 on health beliefs in breast cancer screening practices. Our findings showed that fear of COVID-19 did not negatively affect health beliefs in breast cancer screening practices. On the contrary, it led to an increase in the sub-dimensions of susceptibility and severity.

Our study revealed that the perceived barriers to mammography scores of the illiterate participants were higher than those of the university graduates. The low health literacy of women with low education levels⁽¹⁹⁻²¹⁾ may cause them to have incorrect information about mammography. It can be concluded that this false information may create barriers to mammography and may affect the behavior of women to have regular screening with mammography. As a matter of fact, in our study, it was found that women who did not have regular mammography had a higher perception of mammography barriers. Other studies have also shown a relationship between poor health literacy and low breast cancer screening rates^(22,23).

Our findings showed that the participants with a family history of breast cancer were more sensitive to breast screening and were more likely to take screenings seriously. In addition, the participants who had any breast disease were more sensitive and had lower perceived barriers to mammography. Women with a family history of breast cancer may be

sensitive to and care more about screening practices for reasons such as the breast cancer experience of their relatives and the increase in the level of knowledge during this period. Many studies have shown that women with a family history of breast cancer are more sensitive to screening⁽²⁴⁻²⁶⁾. Similarly, women who have had a breast disease before may also be more sensitive to screening and have lower perceived barriers to mammography due to their experiences during this period and the guidance of health personnel.

The reason why an individual does not engage in health-protective behaviors such as cancer screening is generally explained by the lack of knowledge about the benefits of protective behavior⁽²⁷⁾. Trainings on cancer screening can increase the probability of individuals to have screening. Our study revealed that the participants who received training on breast cancer had higher levels of perceived severity. It has also been reported in some studies that women's breast cancer screening behaviors and perceptions change after training⁽²⁸⁻³⁰⁾.

It is known that one of the reasons for the increased fear of COVID-19 among individuals is the fear of losing their relatives⁽³¹⁾. In our study, the participants who lost a relative due to COVID-19 were found to have a higher fear of COVID-19. This high level of COVID-19 fear may be attributed to the fact that these women witnessed the process their relatives experienced due to the disease and feared that they or another relative might experience the same process. Another study also revealed that the fear of those who lost a relative due to COVID-19 increased significantly⁽³²⁾. In addition, it was observed that these participants had a higher level of perceived severity and perceived barriers to mammography. The loss of relatives may have increased the perception of severity about diseases. Despite the increase in the level of perceived severity, perceived barriers to mammography have also increased, which may be because the participants who lost a relative may have become sensitive to health practices due to the process their relative had to go through.

One of the most important findings of this study is the results showing the effect of fear of COVID-19 on screening beliefs. Fear of COVID-19 had a significant effect on susceptibility and severity scores of the participants. It led to an increase in the susceptibility and severity sub-dimensions of the HBBCS Scale. This finding can be explained by

the personality traits of women. Being sensitive and anxious are characteristic features of people prone to neuroticism⁽³³⁾. The participants of the present study who experienced fear may have a more sensitive and anxious personality. The extremely sensitive and anxious state of these women may contribute to their sensitivity to health issues and their high perception of severity. In fact, studies have established a relationship between fear of COVID-19 and personality traits. Some studies have shown that individuals with neurotic personality traits experience more worrying and negative affect,^(34,35) and more general anxiety and depressive symptoms in their daily lives during the pandemic. One study reported that women who express high neuroticism are more likely to have clinical breast examinations⁽³⁶⁾. In another study, higher neuroticism was found to be associated with higher colorectal cancer screening rates⁽³⁷⁾.

CONCLUSION AND RECOMMENDATIONS

In conclusion, our findings showed that the fear of COVID-19 did not negatively affect women's beliefs about breast cancer screening; on the contrary, women with fear of COVID-19 had higher levels of perceived susceptibility and severity. Health professionals working in primary health care services should particularly try to increase the number of women reached for screening by organizing training programs for breast cancer screening that decreased during the pandemic.

Limitations

This study includes some limitations. One of these limitations is that the data were not collected at the time of the intense pandemic. Another limitation is the limited sample size. Therefore, the results can only be generalized to the research sample.

Author contribution

Study conception and design: CÇ, HNE, and TO, and TO; data collection: HNE, TO, and TO; analysis and interpretation of results: CÇ; draft manuscript preparation: CÇ, HNE, TO, and TO. All authors reviewed the results and approved the final version of the manuscript.

Ethical approval

The study was approved by the Afyonkarahisar Health Sciences University Clinical Research Ethics Committee (Protocol no. 6/13.05.2022).

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Conflict of interest

The authors declare that there is no conflict of interest.

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