

Access this article online

Quick Response Code:



Website:

https://journals.lww.com/jehp/

DOI:

10.4103/jehp.jehp\_1272\_24

# Investigation of the relationship between fear of the pandemic and health beliefs regarding breast cancer of women between the ages of 40-69

Sevgi Gür, Melike Durmaz, Yasemin Şara, Şerife Kurşun Kural<sup>1</sup>

## Abstract:

**BACKGROUND:** Given the paucity of studies in the existing literature that have evaluated the relationship between women's fear of the pandemic and their health beliefs about breast cancer, it was deemed necessary to conduct a study on this subject. The study was designed to ascertain the breast cancer risk status of women aged 40–69 years and to examine the relationship between pandemic fear and health beliefs about breast cancer.

**MATERIALS AND METHODS:** The descriptive and correlational study was conducted online data collection form from July to December 2021. The convenience sampling method was employed to recruit 180 women aged 40–69 years. Data was collected through the “Introductory Information Form”, “COVID-19 Fear Scale” and “Champion's Health Belief Model Scale for Breast Cancer Screening”. “The ‘Breast Cancer Risk Assessment Form’” was used to calculate participants' breast cancer risk scores.

**RESULTS:** The results indicated that the participation rate in the breast cancer screening program during the pandemic period was low (17.8%). A statistically significant positive and very weak relationship ( $\rho = 0.179$ ) was found between the total score of the COVID-19 Fear scale and the total score of the Health Belief Model (HBM) scale. Furthermore, a weak positive relationship ( $\rho = 0.340$ ) was found in the seriousness sub-dimension. These relationships were found to be statistically significant ( $P < 0.01$ ). As the total score of the COVID-19 Fear scale increased, the total score of the HBM scale and the seriousness sub-dimension scores decreased.

**CONCLUSION:** It was found that the fear of contracting COVID-19 negatively affected their behaviors to maintain their health beliefs about breast cancer prevention. As a result, it is recommended that women be encouraged to participate in screening programs to protect, maintain, and improve their health during the pandemic.

## Keywords:

Breast cancer, cancer screening, covid-19, fear, health belief models

## Introduction

Coronavirus 2019 (COVID-19), an infectious respiratory illness caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was first reported in the Chinese city of Wuhan.<sup>[1-3]</sup> The first case of COVID-19 in Turkey was reported on March 10, 2020, and the World

Health Organization (WHO) declared the global pandemic on 11 March 2020.<sup>[2]</sup>

The global impact of pandemics on public health is a significant concern. The impact of a pandemic is not limited to the physiological domain; it also affects individuals on psychological, social, and economic levels. It has been documented in the literature that past epidemics, including H1N1,

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow\_reprints@wolterskluwer.com

**How to cite this article:** Gür S, Durmaz M, Şara Y, Kural ŞK. Investigation of the relationship between fear of the pandemic and health beliefs regarding breast cancer of women between the ages of 40-69. J Edu Health Promot 2025;14:280.

Department of Surgical Nursing, Selçuk University Faculty of Nursing, Konya, Turkey, <sup>1</sup>Department of Nursing, Faculty of Health Sciences, Alanya Alaaddin Keykubat University, Antalya, Turkey

## Address for correspondence:

Dr. Sevgi Gür,  
Department of Surgical Nursing, Faculty of Nursing, Selçuk University, Yeni İstanbul Street  
Number: 299/A Zip Code: 42250, Konya, Turkey.  
E-mail: sevgi.gur@selcuk.edu.tr

Received: 11-07-2024

Accepted: 26-11-2024

Published: 31-07-2025

SARS, and Ebola, have harmed individuals, resulting in the development of psychological disorders such as fear and anxiety. The ongoing global pandemic has had a profound impact on the lives of millions of people, leading to the emergence of a significant global mental health crisis.<sup>[4-6]</sup> Psychological distress has manifested in various forms, including fear, panic attacks, and the development of phobias. Additionally, the constant exposure to news about COVID-19 across diverse media platforms has been linked to heightened anxiety and fear among the general public.<sup>[5,7]</sup>

At the outset of the pandemic, the accelerated dissemination of COVID-19 worldwide and within our country, coupled with the augmented number of patients, rendered hospitals exceedingly perilous environments for the transmission of the virus. To minimize the risk and utilize limited resources effectively, non-emergency health services were suspended.<sup>[1,3,8]</sup> This has resulted in a notable reduction in cancer screening, impacting numerous health services, including those related to cancer screening.<sup>[9]</sup> Given that the pandemic is not yet fully contained, the risk remains. However, due to the heightened demand for health services, the resumption of these services has become imperative.<sup>[10]</sup> It has been advised that healthcare providers maintain their services by adhering to the requisite safety protocols and continuing cancer screenings.<sup>[9,10]</sup>

The provision of services to patients with and without confirmed or suspected infection with COVID-19 within the same system has resulted in a delay in the performance of routine medical examinations and the participation of individuals in screening programs. This situation has harmed the treatment processes of individuals and has resulted in a delay in the diagnosis of cancer at an early stage, because of the inability of individuals to participate in screening programs.<sup>[11]</sup>

According to GLOBOCAN 2022 data, breast cancer, which is a disease where early diagnosis and treatment are of particular importance, is the second leading cause of cancer worldwide (11.6%, 2,308,897 cases) and the fourth most common cause of death (6.9%, 665,684 cases).<sup>[12]</sup> In Turkey, breast cancer is the most common cancer in women, with an age-standardized rate of in 2018, the standardized rate was 45.6 per 100,000.<sup>[13]</sup> Given that one in every four women will develop breast cancer and that incidence is increasing gradually, it is crucial to diagnose breast cancer at an early stage and commence treatment promptly.<sup>[9,14]</sup> Breast self-examination (BSE), clinical breast examination (CBE), and mammography are recommended as part of breast cancer screening programs. By the screening guidelines set forth by the Department of Cancer of the Public Health Institution of Turkey, women between the ages of 20 and 40 are

advised to perform a monthly BSE and undergo a CBE every two years. Women between the ages of 40 and 69 are recommended to perform a monthly BSE, have a CSE annually, and undergo two mammograms per year.<sup>[15]</sup>

The participation of women in breast cancer screening programs may be influenced by several factors, including socio-demographic characteristics, knowledge and risk perception about the disease, and health and cultural beliefs.<sup>[16]</sup> Health belief, which is one of these factors, can be defined as the way individuals express their thoughts and behaviors about their health status or the presence of disease.<sup>[17]</sup> Health beliefs can have a positive or negative impact on individuals' health and also influence their health behaviors. The Health Belief Model (HBM), which elucidates the processes underlying health behavior change and provides guidance for the design of health behavior interventions, has been employed since the 1950s.<sup>[17]</sup> The HBM is a conceptual model that has been employed in the evaluation of a multitude of factors influencing health behaviors in a variety of contexts. These include breast cancer screenings, prostate, cervix, and testicular cancer screenings, diabetes management, and compliance with treatment for hypertension.<sup>[18]</sup> The model has been the basis for numerous studies. A review of the literature reveals that studies evaluating health beliefs about breast cancer screening have reported a lack of knowledge about screening methods among women, as well as low rates of use and low health beliefs.<sup>[19-21]</sup> These findings highlight the importance of identifying women at increased risk of breast cancer, understanding their beliefs about breast cancer and screening, and facilitating the adoption of positive health behaviors.<sup>[21]</sup>

Despite the importance of early diagnosis and treatment in breast cancer, recommendations to remain at home except in urgent or important situations and individuals' fears of the pandemic have resulted in a decline in participation in breast cancer screening programs and the cancellation or postponement of imaging appointments.<sup>[8,22-24]</sup> In their study to determine the impact of the COVID-19 pandemic on breast cancer diagnosis, Gathani *et al.* (2021)<sup>[24]</sup> reported a 28% reduction in the total number of referrals to breast cancer diagnostic units during the initial six-month period of 2020 in comparison to the same period in the previous year. The same period in 2019 saw 322,994 cases in comparison to 231,765 in 2020. A further study, conducted across 28 states in the United States and involving 9.8 million patients, indicated that the number of breast cancer screenings was 29% lower than before the pandemic.<sup>[25]</sup> It has been documented in the literature that the pandemic will impact the diagnosis and treatment processes of all cancers in both the short and long term, leading to an increase in cancer cases.<sup>[8,22,24]</sup>

Given the paucity of studies in the existing literature that have evaluated the relationship between women's fear of the pandemic and their health beliefs about breast cancer,<sup>[26-28]</sup> it was deemed necessary to conduct a study on this subject. It was hypothesized that the study would contribute to the existing literature on this topic. The objective of the study was to ascertain the risk status of breast cancer in women aged 40 to 69 years and to examine the relationship between fear of the pandemic and health beliefs about breast cancer.

## Materials and Methods

### Study design and setting

The descriptive and correlational study was conducted between July and December 2021 with the assistance of an online data collection form.

### Study participants and sampling

A convenience sampling method was employed to recruit a total of 180 women for the study. The sample comprised healthy women between the ages of 40 and 69 who were literate, had access to a telephone and used the Internet, and volunteered to participate in the study. The snowball sampling technique, which is one of the improbable sampling methods, was employed to sample the participants. To perform snowball sampling, a connection was established with one of the units within the universe. The second individual was reached with the assistance of the initial contact, who in turn facilitated access to the third person. The required sample size was calculated using G Power 3.1.9.2. The study had a power of 95% with an alpha value of 0.05, which represents a moderate level of power and an adequate sample size (the number of participants required to be included in the study is 173).

### Data collection tool

The following instruments were employed to collect data for the study: the Introductory Information Form, the COVID-19 Fear Scale, and the Champion's HBM scale for Breast Cancer Screening. The participants' breast cancer risk scores were calculated using the Breast Cancer Risk Assessment Form. The online data collection form was distributed to the participants via social media and email. Following their reading and acceptance of the purpose of the study and the informed consent text presented in the introduction to the online questionnaire form, the participants were enrolled in the study.

### Introductory information form

The form, which was developed by the researchers based on an analysis of existing literature,<sup>[20,21,29]</sup> comprises two sections. The initial section of the questionnaire encompasses 15 inquiries (including age, height, weight, educational background, marital status,

employment status, and income status) to elucidate the socio-demographic characteristics of the female participants in the study. The second section of the questionnaire comprises 10 questions designed to ascertain the women's participation in breast cancer screening programs both before and following the pandemic, as well as their current status regarding COVID-19.

### COVID-19 fear scale

The COVID-19 Fear Scale is a tool designed by Ahorsu *et al.*<sup>[30]</sup> for measuring fear levels among individuals during the ongoing pandemic. It has been adapted for use in Turkish in several studies, and its validity and reliability have been established.<sup>[31-33]</sup> In this study, the scale, which has previously demonstrated validity and reliability according to Satıcı *et al.*,<sup>[33]</sup> was utilized. The total number of points from all scaled items is a 5-point Likert-type scale, reflecting the level of fear of COVID-19 experienced by the individual (1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, 5 = strongly agree). The scale is free of reverse items, and the range of scores obtainable from it is between 7 and 35. A high score on the scale is indicative of a high level of fear of COVID-19. In the Turkish validation and reliability study of the scale, Cronbach's alpha value was determined to be 0.84. The necessary permissions for use were obtained.

### Champion's health belief model scale in breast cancer screening

In 1984, Victoria Champion developed the HBM scale for breast cancer screening, which was based on the HBM. Subsequent revisions were conducted in 1993, 1997, and 1999. The scale assesses women's beliefs about breast cancer, breast self-BSE, and mammography. The original scale comprises 58 questions and eight subscales. The validity and reliability of the scale have been adapted into Turkish by three separate studies. In Cronbach's alpha evaluations of the scales, alpha values were found to range from 0.58 to 0.89 in Karayurt's study and from 0.75 to 0.87 in Seçginli's study. In the study conducted by Gözümlü and Aydın, the alpha values ranged between 0.69 and 0.83.<sup>[34-36]</sup> The scale, previously validated and established as reliable by Gözümlü and Aydın, was utilized in the study above. The HBM Scale was utilized in the context of breast cancer screening to evaluate an individual's perception and judgment concerning breast cancer and general health. The instrument was comprised of three domains: perceived sensitivity (comprising three items, questions 1-3), seriousness (comprising six items, questions 4-9), and health motivation (comprising five items, questions 10-14). Furthermore, the scale comprised items about barriers related to BSE (eight items, questions 15-22), the benefits of BSE (four items, questions 23-26), BSE self-efficacy (ten items, questions 27-36), and the benefits of mammography (five items, questions 37-41). Additionally, the scale comprised

items about mammography barriers, which were assessed by including eleven items (questions 42–52). Additionally, the benefits of BSE (eight items, questions 15–22), BSE benefits (four items, questions 23–26), BSE self-efficacy (ten items, questions 27–36), and mammography benefits (five items, questions 37–41) and mammography barriers (eleven items, questions 42–52) were also evaluated. The scale employs a Likert format, with responses assigned a value between one and five. The scale employs a scoring system in which the “strongly disagree” response is assigned a value of one, the “disagree” response a value of two, the “undecided” response a value of three, the “agree” response a value of four, and the “strongly agree” response a value of five. As each dimension of the scale is evaluated separately, a total score is not generated. Consequently, the number of points obtained by each individual is equal to the number of dimensions used. The completion of the scale is contingent upon the dimensions employed; it typically takes approximately 12–15 min when all dimensions are included. Accordingly, the minimum score for perceived sensitivity is three, with a maximum of 15. The minimum score for seriousness is five, with a maximum of 25. The lowest possible score for health motivation is 5, with a maximum of 25. The lowest possible score for BSE benefits is 4, with a maximum of 20. The lowest possible score for BSE barriers is 8, with a maximum of 40. The lowest possible score for BSE self-efficacy is 10, with a maximum of 30. The lowest possible score for mammography benefits is 5, with a maximum of 25. The lowest possible score for mammography barriers is 11, with a maximum of 55. Higher scores indicate greater perceptions of both the perceived sensitivity and the severity of a situation, as well as greater perceptions of both the benefits and the barriers associated with it.<sup>[34]</sup> Permission to use the scale was obtained.

### Breast cancer risk assessment form

In 2000, the American Cancer Society devised this assessment tool to evaluate the risk of breast cancer in women. It is recommended for inclusion in the National Family Planning Service Guide. The form is comprised of six sections and 20 sub-items, which inquire about age, body mass index, history of breast cancer, history of familial breast cancer, age at first childbearing, and age at menarche. The total score derived from the six questions is used to determine the risk category, with participants scoring between 10 and 300 points according to their answers to each question. The total score is used to categorize the risk level as follows: A score of 200 or below is classified as “low” risk, 201–300 as “medium”, 301–400 as “high” and 400 and above as “highest” risk.<sup>[29]</sup>

### Data analysis

The data obtained from the study were subjected to analysis using the SPSS 25 software package (Statistical

Package for Social Sciences). The data set included a range of descriptive statistics, including frequency, percentage, mean, standard deviation, and so forth. A Shapiro–Wilk test for conformity to normal distribution was conducted to ascertain which tests would be employed for the evaluation of the scores obtained from the scales. The majority of the scale scores did not conform to a normal distribution, as indicated by the demographic data. Accordingly, non-parametric tests were utilized for the data analysis. The Mann-Whitney U and Kruskal-Wallis tests were employed to make comparisons between groups about numerical data. The inter-scale score relationships were analyzed using Spearman’s Rho correlation coefficient. The internal consistency of the scales was evaluated by calculating the Cronbach alpha coefficient.

### Ethical consideration

Before the commencement of the study, ethical approval was obtained from the Ministry of Health Scientific Research Platform on 31 May 2021 (approval number: 2021\_05\_31T12\_39\_02). Subsequently, ethical approval was obtained from the Selcuk University Faculty of Nursing Non-Interventional Clinical Research Ethics Committee (date: 16 June 2021; decision: 2021/49). To participate in the study, individuals were required to have read and approved the purpose of the study and the informed consent text presented in the introduction section of the online questionnaire. Furthermore, permission was sought and obtained from the individuals responsible for developing the scales for their utilization in the study.

### Results

A socio-demographic analysis of the women who participated in the study revealed the following: 57.8% were 50 years of age or younger; 55.5% had attained at least a bachelor’s degree; 81.1% were married; 60.6% were employed; and 60% had income equal to expenses.

Concerning the general health status of the participants, it was established that the majority (71.1%) had not contracted COVID-19 while the proportion of those who sought medical attention at a health facility for a health issue during the pandemic period was 68.9%.

An analysis of the characteristics of women with breast cancer revealed that 2.2% had previously been diagnosed with the disease, 13.9% had a family history of breast cancer (i.e., a relative, such as an aunt or grandmother, had been diagnosed with the disease), and 83.9% had not been diagnosed with breast cancer. The data indicated that 77.2% of the women had their first menstruation between the ages of 12 and 14, and 87.2% of the women were under 30 years of age at the time of their first birth.



Although 93.9% of the participants had been informed about the breast cancer screening program, only 44.4% had participated in it. Of those who participated in the program, 81.3% were aged 45 years and younger, and 17.2% regularly participated in the breast screening program by the recommended schedule. The proportion of individuals who engaged in the breast cancer screening program during the pandemic period was notably low (17.8%).

Table 1 presents the participation of women in breast cancer screening programs both before and during the period of the pandemic.

The Cronbach's alpha coefficient of the scale measuring fear associated with COVID-19 is 0.874, while the Cronbach's alpha coefficient of the HBM scale is 0.943. The sub-dimensions of the former exhibit a range of reliability coefficients between 0.766 and 0.943. The reliability of the dimensions is high.

A comparison of the participants' characteristics and the scales used revealed no statistically significant differences in total and sub-dimensions of the COVID-19 Fear and HBM scales concerning age, education level, breast cancer risk status, family history of breast cancer, and awareness of breast cancer ( $P > 0.05$ ).

Although no statistically significant difference was observed in the total dimension of the COVID-19 Fear scale according to marital status ( $P > 0.05$ ), a statistically significant difference was evident in the total dimension score of the HBM scale ( $P < 0.05$ ). The mean score for the Health Belief Model scale was found to be higher for married patients than for single patients. No statistically significant differences were observed about the sub-dimensions of the Health Belief Model scale ( $P > 0.05$ ) [Table 2].

Upon examination of the relationships between the total scores of the COVID-19 Fear scale and the total and sub-dimension scores of the HBM scale, a statistically significant positive and very weak relationship ( $\rho = 0.179$ ) was observed between the two variables. A statistically significant positive and weak relationship was observed between the total score of the HBM scale and the total score of the COVID-19 Fear Scale ( $\rho = 0.179$ ;  $P < 0.05$ ). Additionally, a weak positive correlation was identified between the total score of the HBM scale and the seriousness sub-dimension ( $\rho = 0.340$ ;  $P < 0.01$ ). As the total score of the COVID-19 Fear scale increases, the total score of the HBM scale and the seriousness sub-dimension scores decrease, or vice versa [Table 3].

**Table 1: Participation in breast cancer screening programmes before and during the pandemic**

| Before COVID-19                                           |                                                                                         | n   | %    |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------|-----|------|
| Breast self-examination                                   | Yes, I did it once.                                                                     | 10  | 5.6  |
|                                                           | Yes, I do it regularly every month                                                      | 29  | 16.1 |
|                                                           | Yes, sometimes I do.                                                                    | 103 | 57.2 |
|                                                           | No, I didn't.                                                                           | 38  | 21.1 |
| Clinical breast examination                               | Yes, I had it done once.                                                                | 62  | 34.4 |
|                                                           | Yes, I do it regularly                                                                  | 48  | 26.7 |
|                                                           | No, I didn't.                                                                           | 70  | 38.9 |
| Mammography                                               | Yes, I had it taken once.                                                               | 51  | 28.3 |
|                                                           | Yes, I had it taken within the recommended time frame.                                  | 58  | 32.2 |
|                                                           | No, I didn't.                                                                           | 71  | 39.4 |
| Reason for clinical breast examination and/or mammography | I'm in the screening programme because of my age.                                       | 48  | 26.7 |
|                                                           | Performed/withdrawn because I have a relative with breast cancer in my family           | 16  | 8.9  |
|                                                           | Performed/withdrawn for breast problems (such as palpable mass, change in breast shape) | 47  | 26.1 |
|                                                           | Performed/withdrawn because the doctor recommended it                                   | 15  | 8.3  |
|                                                           | I have not had a clinical breast examination and/or mammography                         | 54  | 30.0 |
| During COVID-19                                           |                                                                                         | n   | %    |
| Clinical breast examination                               | Yes, I had it done once.                                                                | 25  | 13.9 |
|                                                           | Yes, I do it regularly                                                                  | 9   | 5.0  |
|                                                           | No, I didn't.                                                                           | 146 | 81.1 |
| Mammography                                               | Yes, I had it taken once.                                                               | 26  | 14.4 |
|                                                           | Yes, I had it taken within the recommended time frame.                                  | 8   | 4.4  |
|                                                           | No, I didn't.                                                                           | 146 | 81.1 |
| Reason for clinical breast examination and/or mammography | I'm in the screening program because of my age.                                         | 21  | 11.7 |
|                                                           | Performed/withdrawn because I have a relative with breast cancer in my family           | 1   | 0.6  |
|                                                           | Performed/withdrawn for breast problems (such as palpable mass, change in breast shape) | 22  | 12.2 |
|                                                           | Performed/withdrawn because the doctor recommended it                                   | 9   | 5.0  |
|                                                           | I have not had a clinical breast examination and/or mammography                         | 127 | 70.6 |

**Table 2: Comparison of participants' marital status and total scores of COVID-19 Fear and Health Belief Model Scales**

| Scales                                       | Mean±Standard Deviation<br>Medyan (Min.-Max.) |                           | Z      | P      |
|----------------------------------------------|-----------------------------------------------|---------------------------|--------|--------|
|                                              | Married (n: 146)                              | Single (n: 34)            |        |        |
| Marital status COVID-19 Fear Scale           | 18.33±6.16 18 (7-35)                          | 18.21±6.80 18 (7-35)      | -0.126 | 0.899  |
| Champion's Health Belief Model Scale (CHBMS) | 151.84±31.92 158.5 (59-237)                   | 142.29±29.74 151 (75-182) | -2.070 | 0.038* |

Z: Mann-Whitney U test. \*P&lt;0.05; \*\*P&lt;0.01; \*\*\*P&lt;0.001

**Table 3: Correlations Between Scores on the COVID-19 Fear Scale and the Health Belief Model Scale**

|                                              | COVID-19<br>Fear Scale |
|----------------------------------------------|------------------------|
| Champion's Health Belief Model Scale (CHBMS) |                        |
| Total score                                  | 0.179*                 |
| Susceptibility                               | 0.048                  |
| Seriousness                                  | 0.340**                |
| Health motivation                            | 0.127                  |
| Barrier BSE                                  | 0.022                  |
| Benefit BSE                                  | -0.037                 |
| BSE self-efficacy                            | 0.079                  |
| Benefits for mammography screening           | 0.136                  |
| Barriers for mammography screening           | -0.001                 |

Rho: Spearman correlation coefficient \*P&lt;0.05; \*\*P&lt;0.01; \*\*\*P&lt;0.001

## Discussion

Breast cancer represents a significant public health concern, with a high prevalence rate among women worldwide.<sup>[14]</sup> Despite advances in early diagnosis and treatment methods, fear and anxiety about breast cancer continue to influence women's health behaviors and attitudes.<sup>[26,37]</sup> During the global pandemic of COVID-19, the most crucial objective was to reduce the spread of the virus. In light of the rising number of positive cases and mortality rates, individuals were advised to remain at home and significant restrictions were imposed. This resulted in the emergence of a novel psychological phenomenon, namely, the fear of contracting and/or dying from COVID-19.<sup>[38]</sup> This situation has harmed women's health beliefs regarding their participation in breast cancer screening programs. The reduction in the number of women attending screening centers, coupled with a shortage of medical personnel able to educate them on this issue, has resulted in a delay in the diagnosis of the disease and an increase in the number of patients presenting with advanced cancer.<sup>[22,26,37]</sup> In all studies conducted in Belgium, Germany, and Denmark, a significant decrease in cancer screening during the pandemic was reported in comparison to the pre-pandemic period.<sup>[39-41]</sup> A study conducted in Malaysia examined the health beliefs and practices of women regarding breast cancer screening. The results indicated that the impact of the pandemic on breast cancer screening was negative, with women expressing concerns about exposure to the virus during appointments.<sup>[37]</sup> According to the 2018 statistics of the Turkish Ministry of Health, the rate of prevalence of

regular BSE in women was reported to be 20%.<sup>[42]</sup> While the participation of women in breast cancer screening programs before the pandemic was 44.4%, this rate decreased to 17.8% during the pandemic period. The findings from the study highlight the significant impact of the COVID-19 pandemic on breast cancer screening participation rates, which is a cause for concern.

The global pandemic caused by COVID-19 has had a significant psychological impact on individuals, particularly on health-related behaviors. A study examining the impact of fear of COVID-19 on women's beliefs about breast cancer screening found that, contrary to expectations, this fear did not negatively impact women's beliefs about the necessity of screening. Instead, many women maintained a positive attitude towards breast cancer screening despite the challenges of the pandemic. This result suggests that fear may influence health behaviors but does not always prevent individuals from seeking necessary medical care.<sup>[28]</sup>

In contrast to the findings of Çevik *et al.*,<sup>[28]</sup> the study conducted by Çalpınici and Öztoprak revealed that 92.3% of women did not undergo cancer screening during the pandemic, and 33% expressed concern about the transmission of the disease.<sup>[26]</sup> The findings of the study conducted by Çalpınici and Öztoprak<sup>[26]</sup> indicated that the fear of contracting COVID-19 had overtaken the fear of contracting breast cancer, resulting in a negative impact on the behaviors and practices employed by individuals to maintain their health beliefs and protect themselves from breast cancer. The study revealed a statistically significant positive correlation between fear of contracting the novel coronavirus and beliefs regarding mammography screening. As levels of fear of contracting the novel coronavirus disease (COVID-19) increased, so too did the decline in beliefs regarding the seriousness of breast cancer and the benefits of screening. The findings of the study align with those of previous research, including studies.<sup>[26,37,39-41]</sup> It was demonstrated that the fear of contracting the novel coronavirus disease (COVID-19) outweighed the fear of developing breast cancer, resulting in a negative impact on health behaviors and practices aimed at maintaining breast cancer prevention beliefs.

Awareness of breast cancer and the associated screening processes is a significant determinant of women's

health beliefs and behaviors. Kayan *et al.*<sup>[43]</sup> reported that women with higher levels of education and more knowledge about breast cancer exhibited higher rates of BSE, CSE, and mammography. In contrast with the findings of Kayan's study,<sup>[43]</sup> the present investigation revealed no statistically significant correlation between the participants' sociodemographic and general health characteristics, including age, educational level, breast cancer risk status, family history of breast cancer, and breast cancer awareness, and the total and sub-dimensions of the COVID-19 Fear and HBM scales related to the novel coronavirus ( $P > 0.05$ ). These findings indicate that the participants' sociodemographic attributes and general health characteristics do not exert a significant influence on the formation of their fears and health beliefs regarding the novel coronavirus.

Although the study did not reveal a statistically significant correlation between marital status and the total score on the Coronavirus Fear scale ( $P > 0.05$ ), a statistically significant difference was observed in the HBM scale scores ( $P < 0.05$ ). In particular, the mean scores for married participants were found to be higher than those for single participants. The results of this study are consistent with those of previous studies<sup>[28,44]</sup> which have demonstrated that marital status can influence health beliefs. Married individuals tend to exhibit higher levels of health motivation and engagement in preventive behaviors, which may be attributed to the shared responsibilities and family health concerns inherent to this life stage.<sup>[28,44]</sup>

### Limitations and recommendation

The study's results can only be generalized to the participants involved in the study. A limitation of the study is that the experiences of women in this process have not been investigated in depth. However, the study's strength lies in its contribution to the existing literature on the relationship between women's fear of the pandemic and health beliefs about breast cancer, which is currently limited. As a future study topic, it may be recommended to conduct qualitative studies to investigate the long-term effects of pandemic fear on health behaviors and to obtain deeper information about women's experiences during this process.

### Conclusion

The study revealed a decline in the participation of women in breast cancer screening programs compared to the pre-pandemic period. The fear of COVID-19 has been identified as a significant factor influencing their behaviors and practices in maintaining their health beliefs about protection from breast cancer. In consideration of these findings, it is recommended that:

- The public should be informed about the safety measures that have been implemented at screening centers to reassure them about the risk of contracting the disease.
- It would be beneficial to offer flexible screening options, such as mobile mammography units, to improve accessibility.
- High-risk and underserved individuals must be identified and encouraged to undergo screening.
- It is recommended that screening recommendations be expanded in collaboration with health professionals providing primary health care.
- It is recommended that screening rates be monitored on an ongoing basis.
- It is imperative to evaluate the long-term consequences of the pandemic.
- Interventions must be guided to guarantee equitable access to early diagnosis services.<sup>[45-48]</sup>

### Acknowledgment

We thank all the participants who shared their information with us.

### List of abbreviations

|             |                                                 |
|-------------|-------------------------------------------------|
| BSE:        | Breast Self-Examination                         |
| CBE:        | Clinical Breast Examination                     |
| COVID-19:   | Coronavirus 2019                                |
| HBM:        | Health Belief Model                             |
| SARS-CoV-2: | Severe Acute Respiratory Syndrome Coronavirus 2 |
| SPSS 25:    | Statistical Package for Social Sciences         |
| WHO:        | World Health Organization                       |

### Ethics committee approval

Before commencing the study, approval was obtained from the Ministry of Health Scientific Research Platform (2021\_05\_31T12\_39\_02). Ethics committee approval was received from Selcuk University Faculty of Nursing Non-Interventional Clinical Researches Ethical Committee (Date: 16.06.2021 Decision: 2021/49).

### Informed consent

Participants were included in the study if they had read and approved the purpose of the study and the informed consent text in the introduction part of the online questionnaire form. Furthermore, permission to utilize the scales was obtained from the individuals responsible for their development.

### Author contributions

Concept – SG, MD, YŞ, ŞKK; Design - SG, MD, YŞ, ŞKK; Supervision - ŞKK; Resources- SG, MD, YŞ, ŞKK; Materials - SG, MD, YŞ, ŞKK; Data Collection and/or Processing - SG, MD, YŞ; Analysis and/or Interpretation - SG, MD, YŞ, ŞKK; Literature Search - SG, MD, YŞ, ŞKK; Writing Manuscript - SG, MD, YŞ, ŞKK; Critical Review – ŞKK.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

## References

- Çelik B, Yasak K, Turhan HD, Çakır DU, Ögce F. Covid-19 salgınında ameliyathane ve vaka yönetimi. *J Anatolia Nurs Heal Sci* 2020;328-39.
- Gök AFK, Eryılmaz M, Özmen MM, Alimoğlu O, Ertekin C, Kurtoğlu MH. Recommendations for trauma and emergency general surgery practice during the COVID-19 pandemic. *Ulus Travma Acil Cerrahi Derg* 2020;26:335-42.
- Karaca AS, Ozmen MM, Uçar AD, Yasti AÇ, Demirel S. General surgery operating room practice in patients with COVID-19. *Turk J Surg* 2020;36:1-V.
- Altun Y. Covid-19 pandemisinde kaygı durumu ve hijyen davranışları. *Sürekli Tıp Eğitimi Dergisi* 2020;29:312-7.
- Arpacı I, Karataş K, Baloglu M. The development and initial tests for the psychometric properties of the COVID-19 Phobia Scale (C19P-S). *Pers Individ Dif* 2020;164:110108.
- Agrawal S, Dayama S, Galhotra A. COVID-19 mental health challenges: A scoping review. *J Educ Health Promot* 2022;11:375.
- Jackson D, Bradbury-Jones C, Baptiste D, Gelling L, Morin K, Neville S, et al. Life in the pandemic: Some reflections on nursing in the context of COVID-19. *J Clin Nurs* 2020;29:2041-3.
- Smetherman DH. Breast cancer screening and the COVID-19 pandemic. *J Breast Imaging* 2021;3:3-11.
- American Cancer Society. Available from: <https://www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection.html>. [Last accessed on 2021 May 20].
- Working Guide and Infection Control Measures in Healthcare Institutions in the COVID-19 Pandemic. Available from: <https://covid19.saglik.gov.tr/TR-66532/saglik-kurumlarinda-calisma-rehberi-ve-enfeksiyon-kontrol-onlemleri.html>. [Last accessed on 2021 May 20].
- Say A, Çakır D. COVID-19 pandemisinde geciken tıbbi bakım sürecinin hastalar üzerindeki etkisi. *EJONS* 2021;17:1-9.
- Bray F, Laversanne M, Sung H, Ferlay J, Siegel RL, Soerjomataram I, et al. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 2024;74:229-63.
- Meme Kanseri Korunma, Tarama, Tanı, Tedavi ve İzlem Klinik Rehberi (Versiyon 1.0). T.C. Sağlık Bakanlığı Sağlık Hizmetleri Genel Müdürlüğü. Available from: [https://dosyamerkez.saglik.gov.tr/Eklenti/38131\\_memekanskr20200720pdf.pdf?0](https://dosyamerkez.saglik.gov.tr/Eklenti/38131_memekanskr20200720pdf.pdf?0). [Last accessed on 2021 May 10].
- Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 2018;68:394-424.
- T.C. Sağlık Bakanlığı Halk Sağlığı Genel Müdürlüğü Kanseri Dairesi Başkanlığı Kanseri Taramaları. Available from: <https://hsgm.saglik.gov.tr/tr/kanser-taramalari>. [Last accessed on 2021 Apr 22].
- Champion VL. Revised susceptibility, benefits, and barriers scale for mammography screening. *Res Nurs Health* 1999;22:341-8.
- Çiftci N, Kadioğlu H. Türkiye’de sağlık inanç modeline dayalı geliştirilen ve Türkçeye uyarlanan ölçekler. *Anemon Muş Alparslan Üniversitesi Sosyal Bilimler Dergisi* 2020;8:2015-21.
- Alyafei A, Easton-Carr R. The Health Belief Model of Behavior Change. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2024. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK606120/>. [Last accessed on 2024 May 19].
- Tahergorabi Z, Mohammadifard M, Salmani F, Moodi M. Breast cancer screening behavior and its associated factors in female employees in South Khorasan. *J Educ Health Promot* 2021;10:102.
- Pak N, Yıldız SE. Kars/Sarıkamuş ilçesinde yaşayan kadınların kendi kendine meme muayenesi hakkındaki sağlık inançlarının incelenmesi. *Ebelik ve Sağlık Bilimleri Dergisi* 2020;3:151-7.
- Kurşun Ş, Altıntuğ K, Ege E, Özbiner H, Demlik GD. Health beliefs of women attending mammography unit and related factors. *J Contemp Med* 2021;11:1-6.
- Amit M, Tam S, Bader T, Sorkin A, Benov A. Pausing cancer screening during the severe acute respiratory syndrome coronavirus 2 pandemic: Should we revisit the recommendations?. *Eur J Cancer* 2020;134:86.
- Warner E, Zhu S, Plewes DB, Hill K, Ramsay EA, Causer PA, et al. Breast cancer mortality among women with a BRCA1 or BRCA2 mutation in a magnetic resonance imaging plus mammography screening program. *Cancers* 2020;12:3479.
- Gathani T, Clayton G, MacInnes E, Horgan K. The COVID-19 pandemic and impact on breast cancer diagnoses: What happened in England in the first half of 2020. *Br J Cancer* 2021;124:710-2.
- Mast C, del Rio AM. Delayed cancer screenings-a second look. Available from: <https://ehrn.org/articles/delayed-cancer-screenings-a-second-look/>. [Last accessed on 2021 May 20].
- Calpbinici P, Uzunkaya PÖ. The effect of fear of COVID-19 on women’s attitudes toward cancer screening and healthy lifestyle behaviors: A cross-sectional study. *Indian J Gynecol Oncolog* 2023;21:45.
- Bea VJ, An A, Gordon AM, Antoine FS, Wiggins PY, Hyman D, et al. Mammography screening beliefs and barriers through the lens of Black women during the COVID-19 pandemic. *Cancer* 2023;129:3102-13.
- Çevik C, Erkan HN, Ok T, Oruç T. The effect of fear of COVID-19 on women’s beliefs about breast cancer screening: A cross-sectional study. *Jaren* 2024;10:130-7.
- Ulusal Aile Planlaması Hizmet Rehberi. (2000). 3. Baskı Damla Matbaacılık, Volume 1, s. 84
- Ahorsu DK, Lin CY, Imani V, Saffari M, Griffiths MD, Pakpour AH. The fear of COVID-19 scale: Development and initial validation. *Int J Ment Health Addict* 2020;1-9. doi: 10.1007/s11469-020-00270-8.
- Haktanir A, Seki T, Dilmaç B. Adaptation and evaluation of Turkish version of the fear of COVID-19 scale. *Death Stud* 2020;1-9. doi: 10.1080/07481187.2020.1773026.
- Ladikli N, Bahadır E, Yumuşak FN, Akkuzu H, Karaman G, Türkkan Z. KOVID-19 Korkusu Ölçeği’nin Türkçe güvenirlik ve geçerlik çalışması. *Int J Soc Sci* 2020;3:71-80.
- Satici B, Gocet-Tekin E, Deniz ME, Satici SA. Adaptation of the fear of COVID-19 scale: Its association with psychological distress and life satisfaction in Turkey. *Int J Ment Health Addict* 2020;19:1980-8.
- Gözüm S, Aydın I. Validation evidence for Turkish adaptation of Champion’s Health Belief Model scales. *Cancer Nurs* 2004;27:6.
- Secginli S, Nahcivan NO. Factors associated with breast cancer screening behaviours in a sample of Turkish women: A questionnaire survey. *Int J Nurs Stud* 2006;43:161-71.
- Gözüm S, Karayurt Ö, Aydın İ. Meme kanseri taramalarında Champion’un Sağlık İnanç Modeli ölçeğinin Türkçe uyarlamalarına ilişkin sonuçlar. *Hemşirelikte Araştırma Geliştirme Dergisi* 2004;6:71-85.
- Htay MNN, Dahlui M, Schliemann D, Cardwell CR, Loh SY, Ibrahim Tamin NSB, et al. Changing health beliefs about breast cancer screening among women in multi-ethnic Malaysia. *Int J Environm Res Public Health* 2022;19:1618.
- Pakpour AH, Griffiths MD. The fear of COVID-19 and its role in preventive behaviors. *J Concurr Disord* 2020;2:58-63.
- Jacob L, Loosen SH, Kalder M, Luedde T, Roderburg C, Kostev K. Impact of the COVID-19 pandemic on cancer diagnoses in general and specialized practices in Germany. *Cancers (Basel)* 2021;13:408.



40. Peacock HM, Tambuyzer T, Verdoodt F, Calay F, Poirrel HA, De Schutter H, *et al.* Decline and incomplete recovery in cancer diagnoses during the COVID-19 pandemic in Belgium: A year-long, population-level analysis. *ESMO Open* 2021;6:100197.
41. Skovlund CW, Friis S, Dehlendorff C, Nilbert MC, Mørch LS. Hidden morbidities: Drop in cancer diagnoses during the COVID-19 pandemic in Denmark. *Acta Oncol* 2021;60:20–3.
42. T.C. Sağlık Bakanlığı Sağlık İstatistikleri Yıllığı 2018. Türkiye Cumhuriyeti Sağlık Bakanlığı Sağlık Bilgi Sistemleri Genel Müdürlüğü. Available from: [https://dosyasb.saglik.gov.tr/Eklenti/36134\\_siy2018trpdf.pdf?0](https://dosyasb.saglik.gov.tr/Eklenti/36134_siy2018trpdf.pdf?0). [Last accessed on 2021 Mar 10].
43. Kayan S, Cinar IO. An examination of variables associated with breast cancer early detection behaviors of women. *Afr Health Sci* 2022;22:133–44.
44. Mahindaratne PP. Assessing COVID-19 preventive behaviours using the health belief model: A Sri Lankan study. *J Taibah Univ Med Sc* 2021;16:914–9.
45. Ng JS, Hamilton DG. Assessing the impact of the COVID-19 pandemic on breast cancer screening and diagnosis rates: A rapid review and meta-analysis. *J Med Screen* 2022;29:209–18.
46. Fu R, Tinmouth J, Li Q, Dare A, Hallet J, Coburn N, *et al.* COVID-19 pandemic impact on the potential exacerbation of screening mammography disparities: A population-based study in Ontario, Canada. *Prev Med Rep* 2024;37:102578.
47. Lee R, Xu W, Dozier M, McQuillan R, Theodoratou E, Figueroa J, *et al.* A rapid review of COVID-19's global impact on breast cancer screening participation rates and volumes from January to December 2020. *Elife* 2023;12:e85680.
48. Figueroa JD, Gray E, Pashayan N, Deandrea S, Karch A, Vale DB *et al.* The impact of the Covid-19 pandemic on breast cancer early detection and screening. *Prev Med* 2021;151:106585.