

ORIGINAL RESEARCH

Comparison of early diagnosis, health lifestyle behaviors and breast cancer worries of women with and without a first-degree relative with a history of breast cancer

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Abstract

Background: Breast cancer ranks first among the cancer types seen in women. This study aimed to compare the early diagnosis, healthy lifestyle behaviors and worry levels over breast cancer of women with and without a first-degree relative with a history of breast cancer (FDRBCH). **Methods:** This cross-sectional study was conducted with a total of 240 women (120 with FDRBCH, 120 without FDRBCH) who had not been diagnosed with breast cancer. Data were obtained using a questionnaire consisting of sociodemographic factors, early diagnosis behaviors, the Breast Cancer Worry Scale, and the Healthy Lifestyle Behaviors Scale II (HLBS-II). The knowledge of breast cancer in women with an FDRBCH and those performing breast self-examination were significantly different ($p < 0.05$). The total breast cancer worry score was significantly high in women with an FDRBCH (11.49 ± 4.34). In addition, the mean scores of health responsibility (22.02 ± 4.88), nutrition (22.70 ± 4.42) and stress management (20.26 ± 4.46) subdimensions of the HLBS-II were significantly higher in women with an FDRBCH. **Results:** The results of this study suggest that having an FDRBCH increases worry over breast cancer but also positively affects participation in early diagnosis and healthy lifestyle behaviors. **Conclusions:** In this respect, it is primarily suggested that women without FDRBCH should be included in breast cancer early diagnosis screening programs and programs that encourage healthy lifestyle behaviors.

Keywords

Breast cancer; Early diagnosis; Family history; Worry; Healthy lifestyle behaviors

1. Introduction

With 1 million new cases each year, breast cancer is the most common female malignancy, and its incidence is increasing rapidly worldwide [1]. The incidence of breast cancer among Turkish women is 43 per 100,000, which ranks breast cancer first out of all cancers [2]. In Turkey, one in every four cancers in women is breast cancer [3]. To control breast cancer, risk factors should be determined, and preventive health behaviors should be practiced by the women themselves [4]. The most crucial identified risk factors for this disease are sex and a family history of breast cancer [5]. First-degree relatives (mothers, sisters, men and daughters) of women with breast cancer are at greater risk than the general population [6]. In addition, 5.0–10.0% of breast cancer cases are due to hereditary factors [7], and consequently, both first- and second-degree relatives of women with breast cancer are at greater risk than the general population [8]. Therefore, to prevent/reduce breast cancer-related deaths, early diagnosis and treatment are important, especially in high-risk women with a first-degree relative with a history of breast cancer (FDRBCH) [9]. The

most reliable approach for the early detection of breast cancer is the implementation of screening programs. These programs increase the probability of being diagnosed with cancer at an early stage and therefore positively affect the treatment process of cancer patients [10]. The American Cancer Society (ACS) recommends breast self-examination (BSE), physician-performed clinical breast examinations (CBEs), and mammography as preventive health behaviors in patients at risk for breast cancer [11]. In Turkey, it is recommended that all women undergo mammography every 2 years starting at age 40 and that those with an FDRBCH should receive CBEs after age 20 [3]. Health statistics indicate that these behaviors in women have not reached the desired levels in Turkey. According to the data, only 19.7% of women aged at least 15 years regularly practiced BSE every month, 60.9% never had a CBE, and 71.1% of women aged 40 and older never had a mammogram [3].

Due to genetic predispositions, the experience of breast cancer in a given individual or individuals close to family members with breast cancer increases breast cancer-associated anxiety and breast cancer risk perception as well as the level of breast

cancer knowledge [12, 13]. Numerous women are concerned about developing breast cancer [1] and anxiety about having cancer is an important factor that directs individuals to early diagnosis/treatment and promotes healthy lifestyle behaviors [14]. According to one study, a history of breast cancer in a woman's family or mother can increase perception and anxiety and can simultaneously encourage preventive health behaviors [15]. In the study by Sinicrope *et al.* [16] (2009), girls whose mothers had breast cancer sought information about BSE, CBE, mammography, the risk of developing breast cancer and healthy lifestyles.

Early detection of breast cancer also increases the life expectancy of women with this disease. This situation has revealed the concept of a healthy lifestyle [17]. Healthy lifestyle behaviors can control factors that affect a person's health and can have a significant effect on his or her health [18]. These behaviors include taking responsibility for one's own health, eating a balanced diet, engaging in adequate and regular exercise, not smoking, establishing positive interpersonal relationships and managing stress [19]. It is essential that individuals at risk of breast cancer engage in healthy lifestyle behaviors to protect and improve their health, cope with problems in cases of illness, and adapt to changes [17].

While risk perceptions as well as knowledge levels of breast cancer are increasing due to the concern of women with a first-degree relative with a history of breast cancer, the worry of being diagnosed with cancer also prevents women from visiting health centers [17]. As worry is a subjective concept, the way in which individuals perceive this emotion is also highly important [14]. While individuals with high levels of cancer-related concern are expected to exhibit protective behaviors, studies have demonstrated that different relationships can be observed between perceived worry and protective behaviors in terms of cancer risk [15, 20].

Many published studies have examined breast cancer-related worry in women and their approaches to early cancer diagnosis methods [21–25]. Only one study has examined the factors that affect breast cancer-related worry and healthy lifestyle behaviors in women, and that study reported that breast cancer concerns are low and that healthy lifestyle behaviors are moderate [17]. A healthy lifestyle reduces the incidence of diseases and mortality rates and has a very important role in cancer prevention [26]. A family history of breast cancer is an important risk factor for women and can increase their level of worry about breast cancer. This worry can in turn positively or negatively affect women's healthy lifestyle behaviors [27]. After a literature review, we found no study that has compared early diagnosis, healthy lifestyle behaviors and breast cancer-related worry between women with an FDRBCH and women without an FDRBCH in Turkey. To address this lack of evaluation, this study aimed to compare the early diagnosis, healthy lifestyle behaviors, and worry levels in women with and without an FDRBCH.

The following research questions have been developed for the study:

1. Do health lifestyle behaviors of women with and without FDRBCH differ?
2. Does early diagnosis of breast cancer differ in women with and without FDRBCH?

3. Do worries of breast cancer differ in women with and without a FDRBCH?

4. Does the relationship between worries of breast cancer and having healthy lifestyle behaviors differ between women with and without FDRBCH?

2. Materials and methods

2.1 Study design

This research was a comparative, cross-sectional descriptive study that included internal medicine outpatient and oncology polyclinic patients who visited the University Hospital of Gazi in Ankara, Türkiye. Outpatient visitors to this polyclinic between 01 January and 01 July 2022 were interviewed.

2.2 Procedures

The study population consisted of women who applied to the internal medicine outpatient clinic of Gazi University Hospital and women with an FDRBCH among patients diagnosed with breast cancer who were followed up in the oncology polyclinic. The effect size was determined from the results obtained in a similar previous study on the same subject [28]. In this study, the G*Power 3.1 software package (Version 3.1, Franz Faul, Universitat Kiel, Kiel, SH, Germany) was used to determine a sufficient sample size. When the sample size was calculated, the type error margin (α) = 0.05 and the power of the test ($1 - \beta$) = 0.90 were used. The effect size was calculated as 0.423333. As a result of the calculations, the sample size that would provide the appropriate power for the test ($1 - \beta$) = 120 an FDRBCH and 120 without an FDRBCH were calculated. The study population consisted of 245 women (122 with an FDRBCH and 123 without an FDRBCH). Five women refused to participate or did not meet the inclusion criteria. A total of 240 women (with 120 an FDRBCH and 120 without an FDRBCH) agreed to participate in the study (98% response). This study aimed to determine breast cancer patients' concerns, healthy lifestyle behaviors and early diagnosis methods among women who have not been diagnosed with cancer and to provide data for studies and projects that will be performed for breast cancer prevention. Therefore, the inclusion criteria for this study were women who were not diagnosed with breast cancer, provided informed consent, agreed to participate in the study, and did not have a communication barrier. Exclusion criteria for this study were mainly not having time for an interview or not accepting it.

We obtained official permission from the management of the Gazi University Hospital to conduct this study. Before data collection, detailed information about the study was provided, and written and verbal consent was obtained from the participants. The Gazi University Ethical Committee approved the study (project ID: 77082166-604.01.02). The data were obtained via a predesigned survey form prepared by the researchers. The surveys were conducted in Turkish by the researchers at Gazi Hospital via face-to-face interviews. The researcher questioned whether the participants had any doubts and collected the completed questionnaires. The patients who agreed to participate received a code that would guarantee participation.

2.3 Measures

2.3.1 Sociodemographic and health factors

Age, sex, marital status, employment status, education level, income, parental status, cigarette use, alcohol use, having knowledge about breast cancer, performing BSE, and a history of CBE and mammography were recorded.

2.3.2 Breast cancer worry scale (BCWS)

This scale was developed by Lerman *et al.* [29] (1991) to identify anxiety about all types of cancer. Additionally, Taşhan *et al.* [1] (2018) modified the scale specifically for breast cancer and conducted a Turkish validity and reliability study. The scale consists of 6 items. The score that can be given to each question of the 5-point Likert-style scale varies between 0 and 4. The scale does not contain any inverted questions. The highest total score possible is 24, whereas the lowest score is 0. The cutoff point of the scale is 12. Thus, a score of 12 or more on the scale indicates high breast cancer concern, whereas a score of less than 12 indicates low breast cancer concern. Taşhan *et al.* [1] (2018) reported that the Cronbach's α reliability coefficient of the scale was 0.78. In this study, the reliability of the Breast Cancer Worry Scale was high, with a Cronbach's α of 0.84.

2.3.3 Healthy lifestyle behaviors scale II (HLBS-II)

The health-related behaviors of the participants were collected using the Healthy Lifestyle Behaviors Scale II (HLBS-II), which was developed by Walker *et al.* [18] (1987) and revised in 1996. This scale measures health-promoting behaviors associated with an individual's healthy lifestyle. The scale consists of 52 items and has 6 subdimensions. The subdimensions are spiritual growth, health responsibility, physical activity, nutrition, interpersonal relationships and stress management. The overall score of the scale constitutes the healthy lifestyle behavior score. All the items on the scale are positive. The rating is in the form of a 4-point Likert scale: never (1), sometimes (2), often (3), and regularly (4). The lowest score for the whole scale is 52, and the highest score is 208. Higher scores on the scale indicate that the individual applies the specified health behaviors at a high level. The Cronbach's α reliability coefficient of the scale is 0.92. In this study, the reliability of the Healthy Lifestyle Behaviors Scale II was high, with a Cronbach's α of 0.81. A Turkish validity and reliability study was performed by [30].

2.4 Statistical analysis

The data were analyzed via SPSS, version 22.0 (SPSS Inc., Chicago, IL, USA). Frequency and percentage analyses were used to determine the descriptive characteristics of the women who participated in the study and mean and standard deviation statistics were used in the analysis of the scales. The comparisons of demographic factors, screening behaviors (BSE, CBE and mammography), cigarette and alcohol use, knowledge about breast cancer, breast cancer worry and Healthy Living Behaviors Scale II scores among women with and without an FDRBCH were assessed using Pearson's chi-square test,

Fisher's exact test, and *t* test, depending on whether the data were continuous or categorical. Relationships between the women's Breast Cancer Worry Scale scores and their HLBS-II subdimension levels were examined through Pearson correlation analyses. According to calculations provided by the G*Power program, the statistical power of each test was determined to be greater than 80%. The correlation coefficients (*r*) of 0.00–0.25 were very weak, those of 0.26–0.49 were weak, those of 0.50–0.69 were moderate, those of 0.70–0.89 were high, and those of 0.90–1.00 were very high. The statistical significance level was determined by $p < 0.05$.

3. Results

In this study, a significant difference was found between women with and without first-degree relatives with a history of breast cancer in terms of their sociodemographic factors, such as age, employment status, educational status, marital status, and parental status ($p < 0.05$). In addition, a significant difference was observed between women with and without first-degree relatives with a history of breast cancer in terms of smoking status and alcohol use ($p < 0.05$). When women's knowledge about breast cancer was evaluated, a significant difference was observed between women with and without first-degree relatives with a history of breast cancer in their knowledge of early diagnosis methods and in the ability to perform breast self-examinations ($p < 0.05$). The use of CBE and mammography did not significantly differ between women with and without first-degree relatives with a history of breast cancer ($p > 0.05$) (Table 1).

3.1 Breast cancer worry and healthy living behaviors scale II scores

The total scores of the Breast Cancer Worry Scale differ significantly according to the presence of an FDRBCH ($p < 0.05$). The total scores of those with an FDRBCH (11.49 ± 4.34) were higher than the total scores of those without an FDRBCH (8.60 ± 4.75). However, the mean total score of breast cancer worry in both groups was lower than the cutoff point. When the Healthy Lifestyle Behaviors Scale was used, the health responsibility scores of women with and without an FDRBCH differed significantly ($p < 0.05$). The health responsibility subscale score of those with an FDRBCH was 22.02 ± 4.88 , while those who did not have an FDRBCH had higher health responsibility scores (20.45 ± 4.51). The nutrition subscale scores differed significantly between women with and without an FDRBCH ($p < 0.05$). The nutritional score of participants with an FDRBCH (22.70 ± 4.42) was greater than that of participants without an FDRBCH (20.91 ± 3.75). The stress management subscale scores also differed significantly between women with and without an FDRBCH ($p < 0.05$). The stress management subscale scores of the women with an FDRBCH (20.26 ± 4.46) were higher than those of the women without an FDRBCH (18.86 ± 3.74). The total healthy lifestyle behavior, physical activity, spiritual development, and interpersonal relations scores did not differ significantly between women with and without an FDRBCH ($p > 0.05$) (Table 2).

TABLE 1. Descriptive factors of the participants.

Demographics and health history	Negative family history (n = 120) n (%)	Positive family history (n = 120) n (%)	χ^2	p value
Age (mean 37.8 \pm 10.1) (yr)				
≤ 30	40 (33.3)	21 (17.5)		
31–40	39 (32.5)	47 (39.2)	13.414	0.004*
41–50	23 (19.2)	41 (34.2)		
≥ 50	18 (15.0)	11 (9.2)		
Employment Status				
Yes	82 (68.3)	55 (45.8)	12.399	0.001*
No	38 (31.7)	65 (54.2)		
Education Level				
Primary School	3 (2.5)	17 (14.2)		
Secondary School	4 (3.3)	14 (11.7)	38.251	0.001*
High School	21 (17.5)	43 (35.8)		
Undergraduate or Postgraduate	92 (76.7)	46 (38.3)		
Income Status				
Lower than expenses	25 (20.8)	27 (22.5)	0.162	0.922
Equal to Expenses	73 (60.8)	70 (58.3)		
More Than Expenses	22 (18.3)	23 (19.2)		
Marital Status				
Single	51 (42.5)	34 (28.3)	5.265	0.015*
Married	69 (57.5)	86 (71.7)		
Parental Status				
Yes	65 (54.2)	82 (68.3)	5.074	0.017*
No	55 (45.8)	38 (31.7)		
Cigarette Use				
Yes	39 (32.5)	25 (20.8)	4.176	0.029*
No	81 (67.5)	95 (79.2)		
Alcohol Use				
Yes	25 (20.8)	12 (10.0)	5.400	0.015*
No	95 (79.2)	108 (90.0)		
Knowledge About Breast Cancer				
Yes	84 (70.0)	112 (93.3)	21.818	0.001*
No	36 (30.0)	8 (6.7)		
Performs BSE				
Yes	65 (54.2)	83 (69.2)	5.711	0.012*
No	55 (45.8)	37 (30.8)		
Has undergone CBE				
Yes	45 (37.5)	56 (46.7)	2.069	0.095
No	75 (62.5)	64 (53.3)		
Has undergone mammography				
Yes	29 (24.2)	39 (32.5)	2.052	0.099
No	91 (75.8)	81 (67.5)		

* $p < 0.05$. BSE: breast self-examination; CBE: clinical breast examinations.

TABLE 2. Breast cancer worry and HLBS II scores of the participants.

	Negative family history Mean \pm SD	Positive family history Mean \pm SD	<i>t</i>	<i>p</i> *
Breast Cancer Worry Total Score	8.60 \pm 4.75	11.49 \pm 4.34	-4.915	0.001**
HLBS II Total Score	127.82 \pm 19.82	131.39 \pm 23.03	-1.286	0.200
Health Responsibility	20.45 \pm 4.51	22.02 \pm 4.88	-2.578	0.011*
Physical Activity	15.78 \pm 5.01	15.57 \pm 5.14	0.318	0.751
Nutrition	20.91 \pm 3.75	22.70 \pm 4.42	-3.366	0.001**
Spiritual Development	26.35 \pm 4.69	26.09 \pm 5.39	0.396	0.693
Interpersonal Relations	25.45 \pm 4.11	24.73 \pm 4.80	1.241	0.216
Stress Management	18.86 \pm 3.74	20.26 \pm 4.46	-2.632	0.009*

* $p < 0.05$; ** $p < 0.001$. HLBS II: Healthy Lifestyle Behaviors Scale II; SD: Standard Deviation.

3.2 Correlation analysis between breast cancer worry and healthy lifestyle behavior scores

The relationships between breast cancer concerns and the subscales that determine healthy lifestyle behaviors in the participants with and without an FDRBCH were analyzed via a correlation analysis. No significant correlation was seen among breast cancer anxiety, total healthy lifestyle behavior, health responsibility, physical activity, nutrition, spiritual development, interpersonal relations, and stress management scores in women without an FDRBCH ($p > 0.05$). A correlation analysis of the total breast cancer anxiety, healthy lifestyle behavior, health responsibility, physical activity, nutrition, spiritual development, interpersonal relationships, and stress management scores of the participants with an FDRBCH revealed a weak ($r = 0.294$) positive ($p = 0.001 < 0.05$) correlation between health responsibility and total breast cancer concern and a weak ($r = 0.263$) positive ($p = 0.004 < 0.05$) correlation between nutrition and the total score of anxiety related to breast cancer. No significant difference was observed in the correlations between other variables ($p > 0.05$) (Table 3).

4. Discussion

In our study, it was determined that women without an FDRBCH consumed more cigarettes and alcohol, had less breast cancer knowledge, and had lower rates of BSE, CBE and mammography than women with an FDRBCH. In addition, worries about breast cancer and healthy lifestyle behaviors were lower in women without an FDRBCH. A weak positive correlation was found between health responsibility and the total breast cancer worry score, and a positive correlation was found between nutrition and the total breast cancer worry score in women with an FDRBCH. No such associations were found in women without an FDRBCH.

It is essential to encourage women to acquire healthy lifestyle behaviors and to undergo regular cancer early diagnostic tests designed to protect women from breast cancer. However, various psychosocial factors affect the adoption of protective behaviors [31]. Worrying about a cancer diagnosis is one of these psychosocial factors [32]. For this reason, in our study, which we conducted to determine

the relationships among the level of breast cancer worry in women, early diagnostic screening and healthy lifestyle behaviors, we discuss the findings in the context of the relevant literature.

In our study, a high majority of women with FDRBCH stated that they had knowledge about breast cancer ($p < 0.05$). Taylan and Çelik (2020) reported similar results and reported that the level of knowledge of breast cancer among women with a family history of breast cancer is greater than that among women without a family history of breast cancer [8]. Multiple studies have found that women with a family history of breast cancer have greater knowledge about breast cancer than women without a history of breast cancer, and therefore, it is important to educate all women in society about breast cancer.

In this study, the proportion of women who practiced BSE and CBE and had undergone mammography was greater among those with an FDRBCH than among those without an FDRBCH. However, although the rates of mammography and CBE were high, no significant difference was found between the groups ($p > 0.05$). The percentage of women who underwent CBE and mammography was well below the desired level in both groups. Although the World Health Organization (WHO) and ACS reported that BSE has no clear benefits as a breast cancer screening approach, women need to perform BSE regularly, as it has been demonstrated to be effective in motivating them to assume responsibility for their health and in raising awareness about breast cancer [23]. According to the literature, women with a family history of breast cancer care more about adopting cancer screening behaviors, and they undergo mammography and CBE more often than other women [10, 33, 34]. Additionally, Cohen reported a significantly higher rate of BSE in women with a family history of breast cancer [10, 33, 35]. Similarly, in the study by Bebis *et al.* [36] (2013), 64.7% of women with first- and second-degree relatives with breast cancer performed BSE. Although it was concluded in our study that a family history of breast cancer exerted a positive effect on participation in early diagnosis behaviors, both groups exhibited limited participation. The reason for this undesirable result may be that these women do not need health check-ups.

In our study, breast cancer worry was found to be greater

TABLE 3. Correlation analysis between breast cancer worry scale scores and healthy lifestyle behaviors scale scores.

	Negative family history Breast Cancer Worry	Positive family history Breast Cancer Worry
Healthy Lifestyle Behaviors—Total Score		
<i>r</i>	0.091	0.135
<i>p</i>	0.323	0.141
Health Responsibility		
<i>r</i>	0.159	0.294
<i>p</i>	0.083	0.001**
Physical Activity		
<i>r</i>	0.062	-0.026*
<i>p</i>	0.499	0.776
Nutrition		
<i>r</i>	0.096	0.263
<i>p</i>	0.295	0.004**
Spiritual Development		
<i>r</i>	-0.021	-0.002**
<i>p</i>	0.819	0.983
Interpersonal Relations		
<i>r</i>	0.040	0.061
<i>p</i>	0.666	0.505
Stress Management		
<i>r</i>	0.093	0.081
<i>p</i>	0.314	0.378

* $p < 0.05$; ** $p < 0.001$; $r =$ Pearson's correlation analysis.

in women with a family history of breast cancer. A study by April-Sanders *et al.* [37] (2017) revealed that among sisters of women diagnosed with breast cancer, 29% had a high level, 34% had a moderate level, and 37% had a low level of worry about breast cancer. Similarly, other studies have reported that cancer worry is increased in women with a family history of breast cancer [35, 38]. Nacar reported that breast cancer worry levels were very low in his study of women without a family history of breast cancer [22]. Gozuyesil *et al.* [17] (2019) reported that breast cancer worry levels were low in their study of healthy women. A woman's family history of breast cancer increases her level of breast cancer worry, and according to the results of this study, a family history of breast cancer has a positive effect on early diagnosis behaviors.

Breast cancer is an important disease that causes concern in all women because of its increasing incidence worldwide [39]. Life expectancy increases with early diagnosis, and the importance of healthy lifestyle behaviors is well known [40]. In this study, the total mean score of the Healthy Lifestyle Behaviors scale of women with an FDRBCH was found to be higher than that of women without an FDRBCH. Considering that the highest score that can be obtained from the scale is 208, the healthy lifestyle behaviors of women with an FDRBCH are above the moderate level. According to previous studies on healthy lifestyle behaviors, in the study of adult women by Sonmezer *et al.* [41] (2012), the total score obtained

from the HLBS-II was 126.8 ± 19.2 . A study by Demir and Ariöz on migrating women reported a value of 127.30 ± 19.53 [41, 42]. These results are similar to those of our study; however, contrary to these studies, Bilal reported a total score of 107.35 ± 20.22 in his study of women in reproductive and menopausal periods and also reported that the healthy lifestyle behaviors of these women were moderate [43]. The results of this work and those of previous studies suggest that women with a family history of breast cancer exhibit more healthy lifestyle behaviors and are aware of the importance of those behaviors.

The healthy lifestyle behaviors of women affect their knowledge and practices related to early cancer screening. Healthy lifestyle behaviors are crucial for reducing the number of individuals with disease, reducing mortality rates and preventing cancer [44]. In our study, the mean scores of the health responsibility, nutrition and stress management subdimensions of women with a family history of breast cancer were significantly greater than those of women without a family history of breast cancer. The lowest score was obtained from the physical activity subdimension in both groups. Gülcivan and Topçu examined the healthy lifestyles of patients with breast cancer and obtained results similar to those of our study. The authors stated that they obtained high scores from all subdimensions and that the lowest score was from the physical activity subdimension [26]. Studies conducted in various

patient groups have shown that physical activity has the lowest subscale mean score [44–47]. In their study of healthy women, Yılmazel and Büyükkayacı (2016) reported that the highest scores were obtained from the spirituality, health responsibility and interpersonal relationships subdimensions, while the lowest score was obtained from the physical activity subdimension [48]. In contrast to these reports, in a study conducted in women working in a greenhouse in a town in Turkey, women reported low scores for the subdimensions of the HLBS-II, with a mean score of 6.88 ± 2.36 for the physical activity subdimension [49]. The results of our study suggest that the low score in the physical activity subdimension is due to the low level of physical activity in Turkish society. In addition, the results of this study suggest that women with any chronic disease or family history of cancer are aware of the importance of healthy lifestyle behaviors.

The present study has several important limitations. First, no established method was used in the selection of the participants, and the study was conducted only in the relatives of the patients who visited a hospital. Therefore, the results cannot necessarily be extrapolated to other populations elsewhere in Turkey. Second, the results of the surveys were collected via different data collection methods (face-to-face interviews and telephone interviews). Third, although the sample size may be considered small, the statistical power of the study was found to be sufficient to interpret the data obtained in the study.

5. Conclusions

Although it was concluded in our study that a family history of breast cancer had a positive effect on participation in early diagnosis behaviors, it was determined that both groups exhibited limited participation. According to the literature, many women in Türkiye do not participate in screening programs and health check-ups, which may be because these women do not require health check-ups [50]. In addition, women with an FDRBCH are more likely to worry about breast cancer. In addition to their average overall scores for healthy lifestyle behaviors, the scores for the subdimensions of health responsibility, nutrition, and stress management were similarly higher for women with an FDRBCH. In both groups, low scores were obtained for physical activity subdimension. Finally, correlation analyses were performed for breast cancer worry, healthy lifestyle behaviors, health responsibility, physical activity, nutrition, spiritual development, interpersonal relations, stress management, health responsibility and nutrition among women with and without an FDRBCH. A weak positive correlation was found for the total score for breast cancer worry. According to the results of this study, a family history of breast cancer increases breast cancer worry, and breast cancer worry in turn positively affects early diagnosis behaviors. Increased breast cancer worry has been shown to encourage early diagnosis behaviors. The results of this study are especially important in terms of preventive health services. In line with these results, it is recommended that women who do not have a family history of breast cancer primarily receive qualified training on the early diagnosis of breast cancer, demonstrate health behaviors regarding early diagnosis practices, and raise awareness among all women about

healthy lifestyle behaviors. Health professionals should guide women without FDRBCH to acquire positive healthy lifestyle behaviors and participate in breast cancer screening programs, not primarily women with FDRBCH, who are known to be at risk for breast cancer, as women without FDRBCH may be less likely to develop breast cancer. To overcome the limitations of this study, different studies that examine healthy lifestyle behaviors and breast cancer concerns in different societies and that compare women with and without a family history of breast cancer are needed. Moreover, it is recommended that further methodologies be investigated in future planned studies and more data be collected to reveal new problems.

AVAILABILITY OF DATA AND MATERIALS

The data are contained within this article.

AUTHOR CONTRIBUTIONS

ŞZA—conceptualization, methodology, formal analysis, investigation, writing—original draft preparation, writing—review and editing. BA—validation, writing—original draft preparation. ENK—validation, writing—review and editing. All authors contributed to editorial changes in the manuscript. All authors have read and agreed with the published version of the manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was conducted in accordance with the Declaration of Helsinki. Official permissions for conducting the study were obtained from the ethics committee of Gazi University (Registration No: 07; Date: 14 July 2020), Gazi University Hospital. All participants provided written and signed informed consent.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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