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An Examination of Five-Year Community-Based Breast Cancer Screening Results: A Retrospective Descriptive Study

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ABSTRACT

Purpose: Breast cancer is the most common type of cancer in women. The success of treatment is directly related to early detection. The importance of screening programs is significant in achieving early detection. This study aimed to examine the five-year community-based breast cancer screening results.

Methods: The study is a retrospective descriptive study. The data were obtained by analyzing the 2018 and 2022 records of the Cancer Early Diagnosis, Screening, and Education Center, where community-based screenings are conducted. According to the breast cancer screening results performed in five years, mammography results in line with BI-RADS (Breast Imaging Reporting and Dated System) scoring, women's age, and the number of women screened by year were examined.

Results: The rates of reaching the target population between the years 2018 and 2022 were 5.6%, 5.7%, 1.7%, 3.1%, and 7%, respectively. Over this five-year period, it was observed that 4.6% of the target population was reached on average. The number of women screened in 2020 and 2021 was lower compared to other years. The analysis of the distribution of mammography results across the years showed that the majority of reports were classified as BI-RADS 1-2 (94.7%, 95.7%, 91.5%, 93.6%, and 93.2%, respectively). A significant difference was observed in the age distribution of women based on the BI-RADS scoring (F=31.918; P<0.001).

Conclusion: The rate of reaching the target population over the five-year period was found to be quite low. It is essential to enhance both the quantity and quality of awareness programs conducted by public health nurses level to increase women's participation in the screening program.

Keywords: Breast cancer; cancer screening; woman

ÖZET

Amaç: Meme kanseri kadınlarda en sık görülen kanser türüdür. Tedavinin başarısı erken tanı ile doğru orantılıdır. Erken tanıda tarama programlarının önemi büyüktür. Bu çalışmada beş yıllık toplum tabanlı meme kanseri tarama sonuçlarının incelenmesi amaçlandı.

Yöntemler: Bu çalışma retrospektif tanımlayıcı bir çalışmadır. Veriler toplum tabanlı taramaların gerçekleştirildiği Kanser Erken Teşhis Tarama ve Eğitim Merkezi 2018-2022 kayıtlarının incelenmesi ile elde edildi. Beş yılda gerçekleştirilen meme kanseri tarama sonuçlarına göre BI-RADS (Breast Imaging Reporting and Dated System) skorlaması doğrultusundaki mamografi sonuçları, kadınların yaşı, yıllara göre tarama yapılan kadın sayısı incelendi.

Bulgular: Yıllara göre hedef nüfusa ulaşma oranı sırasıyla %5,6, %5,7, %1,7, %3,1, %7'dir. Beş yıllık süreçte hedef nüfusun %4,6'sına ulaşıldığı görüldü. 2020 ve 2021 yıllarında tarama yapılan kadın sayısı diğer yıllara göre daha düşüktü. Yıllara göre mamografi sonuçlarının dağılımı incelendiğinde her yıl (sırasıyla %94,7, %95,7, %91,5, %93,6, %93,2) için en çok BI-RADS 1-2 şeklinde raporlandığı tespit edildi. BI-RADS skorlamasına göre kadınların yaş dağılımının farklılık gösterdiği belirlendi (F=31,918; P<0,001).

Sonuç: Beş yıllık süreçte hedef nüfusa ulaşma oranı oldukça düşüktür. Tarama programına kadınların katılımının arttırılması için halk sağlığı hemşireleri toplumu bilinçlendirme programlarının hem nicel hem niteliğini arttırması gerekmektedir.

Anahtar Kelimeler: Meme kanseri; kanser taraması; kadın

According to the World Health Organization's 2020 cancer statistics, breast cancer is the most frequently diagnosed cancer in women, and 6.9% of cancer-related deaths are attributed to breast cancer (1). It is reported that in 2020, there were 2.3 million women diagnosed with breast cancer worldwide, and 685 000 deaths were attributed to breast cancer (2). In Turkey, according to the cancer statistics for the year 2018 published by the Ministry of Health in 2021, one in every four cancer cases in women is breast cancer. Within one year, a total of 24 518 women were diagnosed with breast cancer (3). Breast cancer ranks highest among cancer-related deaths in women in our country. Early detection can reduce breast cancer-related deaths (4). Screening programs play a vital role in early detection (5). Community-based breast cancer screening programs have been shown to reduce the specific mortality rate of breast cancer by enabling early detection (6).

Mammography is used for breast cancer screening in community-based programs. The frequency of screening and the target age group vary among countries. In Australia, mammography is performed every two years starting from the age of 40, and annual screening is targeted for women aged between 50 and 74 years. In Brazil, screening is conducted every two years for women aged between 50 and 69 years. In Canada, screening is performed by regional and provincial governments and varies between regions. Generally, women aged 50 to 74 years are screened every two years, while some programs offer screening for women aged between 40 and 49 years either yearly or every two years. In Germany, screening is done every two years for women aged between 50 and 69 years, while in Italy, screening is conducted every two years for women aged between 50 and 69 years, with annual screening for women aged between 45 and 49 years and screening every two years for women aged between 70 and 74 years. In the United States, the first mammography is done between the ages of 40 and 44 years, yearly for women aged between 45 and 54 years, and every two years or yearly for women aged 55 years and above (4).

In Turkey, breast cancer screenings are conducted through opportunistic and community-based screening, and the National Standards for Breast Cancer Screening Program state that "Screening will start at the age of 40 and end at the age of 69 in women (including ages 40 and 69). The target population to be screened should be defined based on individuals registered with family physicians, and screening should be repeated every two years using developed invitation methods" (7). Community-based screening is conducted at Cancer Early Diagnosis, Screening, and Education Centers (KETEM), while opportunistic screenings are performed at Level 2 and Level 3 hospitals. Mammography images are reported according to the American College of Radiology (ACR) BI-RADS criteria (8). Women are informed about their mammography results, and if the result is normal, they are invited for another mammography in two years. Women with BI-RADS Score 0, 4, and 5 are referred to higher-level centers for further evaluation (8, 9). The goal in cancer screenings is to reach 70% of the target population (10). However, it has been reported that this target is not fully achieved in our country (9). The aim of this study is to examine the five-year results of breast cancer screening. While there are studies examining breast cancer screening results for one or two years in the literature in our country, no studies evaluating the results over a five-year period have been found.

Material and Methods

Research Type
This is a retrospective descriptive study.

Population and Sample
The population of the study consisted of all women who underwent breast cancer screening in Afyonkarahisar province between January 1, 2018, and December 31, 2022. The study did not employ a sampling method, and all screening results were included in the study.

Procedure
The research was performed by conducting an archive search from the computer records in the Non-Communicable Diseases Unit of the Public Health Directorate, where community-based screening results are registered in the Public Health Management System (HSYS). Mammography results based on the BI-RADS (Breast Imaging Reporting and Data System) scoring system, age of women, and the number of women screened for each year between January 1, 2018, and December 31, 2022, were obtained from the records. To calculate the rate of reaching the target population, the population of women aged 40-69 in the province where the study was conducted was obtained from the publicly available records of the Turkish Statistical Institute (11). Mammography results are evaluated using the BI-RADS score categories. The explanations for this scoring system are provided below (12).

BI-RADS 0: Unclear assessment. Additional imaging evaluation is needed.

BI-RADS 1: Normal. Follow-up at regular intervals.

BI-RADS 2: Benign. Follow-up at regular intervals.

BI-RADS 3: Probably benign. Follow-up at short intervals.

BI-RADS 4: Suspicious abnormality. Biopsy should be considered.

BI-RADS 5: High probability of malignancy. Biopsy or surgical procedure should be performed.

BI-RADS 6: Histologically proven malignancy

Ethical Considerations

Ethical approval (Date/Number: 2023/174) was obtained from the ethical committee of a university. In addition, permission to access the records was obtained from the Provincial Health Directorate (E-40043106-604,01,02-213811022).

Statistical Analysis

Statistical analysis was performed using IBM SPSS Statistics for Windows, Version 25.0 program. The number of women screened across the years, the rate of reaching the target population, the frequency and percentage values of the mammography results based on the BI-RADS classification, the mean age of screened women, and the mean standard deviation according to BI-RADS scoring were given. The age distribution of women based on the BI-RADS scoring was analyzed using the One-Way ANOVA test to determine if there were any differences. The Duncan test was used for multiple comparisons. The significance level was set at $P<0.05$.

Results

The mean age of women who underwent screening between the specified years is 51.16 ± 7.75. Over the five-year period, a total of 29,547 women underwent breast cancer screening. The rate of reaching the target population each year was as follows: 5.6%, 5.7%, 1.7%, 3.1%, and 7%, respectively (Table 1). It was found that over the course of five years, only 4.6% of the target population was reached (Table 1).

Table1: Number of women screened by years, total population between the ages of 40-69 and the rate of reaching the target population			
Year	Total population between the ages of 40-69	Number of women screened	The rate of reaching the target population
2018	122 682	6 898	5.6
2019	124 210	7 130	5.7
2020	126 892	2 096	1.7
2021	130 412	4 095	3.1
2022	132 799	9 328	7.0
Total	636 995	29 547	4.6

Upon analyzing the distribution of mammography results over the five-year period, it was evident that the majority of reports were consistently classified as BI-RADS 1-2 each year, with percentages of 94.7%, 95.7%, 91.5%, 93.6%, and 93.2%, respectively (Table 2). The rate of BI-RADS 4 scoring, which indicates suspicious abnormalities, ranged between 0.3% to 0.6%, while the rate of BI-RADS 5 scoring, indicating a high likelihood of malignancy, ranged between 0.1% to 0.3% (Table 2).

Table 2: Distribution of mammography results by years									
Year	Age Mean±SD(Min-Max)	BI-RADS 0		BI-RADS 1-2		BI-RADS 4		BI-RADS 5	
		n	%	n	%	n	%	n	%
2018	51.08±7.74 (40-69)	325	4.7	6531	94.7	21	0.3	21	0.3
2019	51.06±7.64 (40-69)	264	3.7	6822	95.7	24	0.3	20	0.3
2020	50.22±7.44 (40-69)	163	7.8	1917	91.5	9	0.4	7	0.3
2021	51.06±7.85 (40-69)	221	5.4	3834	93.6	25	0.6	15	0.4
2022	51.55±7.85 (40-69)	560	6.0	8697	93.2	59	0.6	12	0.1
BI-RADS: Breast Imaging Reporting and Dated System									

Based on the BI-RADS scoring, there is a significant difference in the age distribution of women (F=31.918; P<0.001). According to post hoc test analysis, the average age of women reported as BI-RADS 5 is different from BI-RADS 0, BI-RADS 1-2 and BI-RADS 4. The average age of women reported as BI-RADS 4 is different from BI-RADS 0, BI-RADS 1-2 and BI-RADS 5. The average age of women reported as BI-RADS 1-2 is different from BI-RADS 0, BI-RADS 4 and BI-RADS 5. The average age of women reported as BI-RADS 0 is different from BI-RADS 1-2, BI-RADS 4 ve BI-RADS 5. The mean age of women with a mammography result reported as BI-RADS 5 was found to be higher than those with BI-RADS 4, BI-RADS 1-2 and BI-RADS 0 results (Table 3).

Table 3: The Age Distribution of Women According to BI-RADS Scoring			
BIRADS scoring result	**n**	**Mean±SD**	**F/P**
BI-RADS 0	1533	49.61±7.72[a]	
BI-RADS 1-2	27801	51.22±7.74[b]	**31.918; P<0.001**
BI-RADS 4	138	53.33±8.38[c]	
BI-RADS 5	75	55.27±8.15[d]	

[a,b,c,d] *Means of groups followed by different letters differ; BI-RADS: Breast Imaging Reporting and Dated System*

Discussion

Community-based cancer screening programs are crucial for early diagnosis. The success of a screening program is associated with the number of individuals reached during the screening process. In this study, we aimed to examine the results of breast cancer screening conducted within the scope of community-based screening program between 2018 and 2022.

The analysis of the rates of reaching the target population over the past five years showed that the rate has been low. Especially in 2020 and 2021, the rate of reaching the target population was notably low, which can be attributed to the impact of the COVID-19 pandemic. It has been reported that breast cancer screening rates decreased in many countries during the pandemic (13).

In Turkey, women can undergo mammography not only within the community-based screening program but also in secondary and tertiary healthcare facilities. Considering these additional screenings, the number of women getting screened may be slightly higher. However, it remains evident that the goal of reaching 70% of the population, as set by community-based screening programs, is still far from being accomplished. In a study conducted in another province of Turkey, it was found that only 15.8% of the target population was screened in 2016 and 16.1% in 2017 (14). Another study reported that in 2018, only 12.8% of the target population was reached (9). The difference between Afyonkarahisar, where the research was conducted, and other provinces may be due to variations in the socio-demographic structure of the communities. Examples from other countries showed that in Italy, for instance, the rates of reaching the target population ranged between 37.9% to 61.8% in different regions in 2005 (15). In France, this rate was reported as 47.8% (16). In Croatia, a study analyzing national breast cancer screening results between 2006 and 2016 found that the screened population varied between 59% to 63% (17). The data obtained in our study cannot be generalized to the entire population of Turkey. The rate of reaching the target population may be higher across Turkey. Further research covering the entire country is necessary to discuss breast cancer screening rates at the national level.

The BI-RADS scoring system is a standardized terminology used worldwide for breast imaging reporting and data systems, providing a classification for breast imaging findings based on the likelihood of malignancy, ranging from 0 to 6 (12). When mammography results over the years were analyzed, it was observed that BI-RADS 1-2 reports were the most common results reported over the five-year period. The least common result was BI-RADS 5. Similar results have been reported in other studies as well (8, 14).

Advanced age is a significant risk factor for developing breast cancer (18). One study reported that breast cancer risk increased by 40% between the ages of 55-59 (19). In another study, the estimated risk of developing breast cancer was reported as 1 in 53 for ages below 49, which increased to 1 in 43 for ages between 50-59 (20). Our study's findings support these results since the mean age of women reported with a high likelihood of malignancy (BI-RADS 5) was the highest, followed by women reported with suspicious abnormalities (BI-RADS 4). These findings highlight the importance of commencing screening before the age of 50.

Conclusion

The findings obtained from the five-year community-based screening indicate that the rate of reaching the target population is significantly low. The years 2020 and 2021 had the lowest number of women screened. The most commonly reported mammography result was BI-RADS 1-2. In addition, the mammography results showed that the likelihood of malignancy increases with age. Raising awareness about screenings plays a crucial role in reaching the target population. In this regard, public health nurses should intensify awareness programs to increase the participation of women in screenings. Moreover, the reasons behind women not participating in screenings should be identified, and intervention programs tailored to these reasons should be implemented to educate and empower women.

Limitations

The research includes screening results conducted within the scope of the community-based screening program at the Cancer Early Diagnosis, Screening, and Training Center (KETEM). Records of opportunistic screenings performed at the 2nd and 3rd level healthcare services were not included. In addition, the study reflects the results from one specific province.

Declarations

Authors Disclosure (Conflict of Interest) Statement
The author does not declare any conflict of interest

Funding Statement
The author does not declare any funding.

Ethics Approval
Ethical approval (Date/Number: 2023/174) was obtained from the ethical committee of a university.

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