ANATOL J FAMILY MED
The Anatolian Journal of Family Medicine

Original Article

DOI: 10.5505/ajfamed.2025.42104
AJFAMED 2026;9(1):25–32

Breast Cancer Knowledge and Awareness among Women in Two Socioeconomically Distinct Districts of Ankara

Özlem Durmuş,[1] Şenol Demirci[2], Keziban Avcı[3]

[1]Department of Public Health Services, Ankara Provincial Health Directorate Cancer Unit, Ankara, Türkiye

[2]Health Institutes of Türkiye (TUSEB), Türkiye Health Care Quality and Accreditation Institute (TUSKA), Ankara, Türkiye

[3]Department of Health Management, Ankara Yıldırım Beyazıt University Faculty of Health Sciences, Ankara, Türkiye

ABSTRACT

Objectives: This study aimed to evaluate the relationship between social determinants of health and women's knowledge and awareness levels regarding breast cancer in two districts of Ankara with distinct socioeconomic profiles.

Methods: A cross-sectional study was conducted among 368 women aged 30–70 years who applied to Cancer Early Diagnosis, Screening, and Training Centers (KETEM) in Çayyolu (high socioeconomic level) and Mamak (middle socioeconomic level). Data were collected using a sociodemographic questionnaire and the breast cancer awareness scale. The scale demonstrated good to excellent reliability (Cronbach's α=0.774–0.973; overall α=0.890), and construct validity was supported by exploratory factor analysis and confirmatory factor analysis with acceptable model fit indices. Statistical analyses included Independent Sample t-tests, analysis of variance, and Pearson correlation.

Results: Women attending the Çayyolu KETEM had significantly higher scores than those attending the Mamak KETEM in the sub-dimensions of Knowledge of Risk Factors (2.26±0.56 vs. 1.94±0.56), Knowledge of signs and symptoms (2.66±0.57 vs. 2.13±0.81), attitudes toward breast cancer prevention (3.90±0.93 vs. 3.47±1.25), and health behaviors related to breast cancer awareness (3.12±1.10 vs. 2.59±0.97) (all p=0.001), while no significant difference was observed in the Barriers to Screening sub-dimension (p>0.05). Education level, marital status, employment, income, and family health background were significantly associated with awareness levels. Women who had received education on breast cancer screening and those who had undergone breast ultrasound exhibited higher awareness scores.

Conclusion: The findings indicate that social determinants such as education, income, and access to health services significantly influence breast cancer awareness. These results underscore the critical role of primary healthcare and public health services, particularly family health centers and community-based screening units, in delivering targeted, culturally adapted breast cancer awareness and screening programs, especially in socioeconomically disadvantaged regions.

Keywords: Attitudes, breast neoplasms, health knowledge, practice, social determinants of health, socioeconomic factors, women's health

Please cite this article as:
Durmuş O, Avcı K, Demirci S. Breast Cancer Knowledge and Awareness among Women in Two Socioeconomically Distinct Districts of AnkaraAJFAMED 2026;9(1):25–32.

Address for correspondence:
Dr. Şenol Demirci.
Health Institutes of Türkiye (TUSEB), Türkiye Health Care Quality and Accreditation Institute (TUSKA), Ankara, Türkiye

Phone: +90 312 920 11 00

E-mail: senoldemrci@gmail.com

Received Date: 15.10.2025
Revision Date: 24.12.2025
Accepted Date: 25.12.2025
Published Online: 24.04.2026

Copyright © Author(s) - Available online at www.AJFAMED.org

OPEN ACCESS

This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

INTRODUCTION

Cancer is a group of diseases characterized by the uncontrolled proliferation and spread of cells resulting from disruptions in cellular proliferation and differentiation mechanisms, leading to invasion of surrounding tissues and metastasis to distant organs.[1] Breast cancer, which develops through the malignant transformation of epithelial cells in the breast tissue, is one of the most common types of cancer among women.[2] Both in Türkiye and worldwide, breast cancer is the most frequently diagnosed cancer among women and remains one of the leading causes threatening women's health.[3]

The incidence and mortality rates of breast cancer are directly associated with a country's income level and socioeconomic development.[4] The positive impact of development level on breast cancer survival is primarily attributed to improved access to early diagnosis and treatment services. Although complete prevention of the disease is not always possible, early detection significantly reduces morbidity and mortality, thereby improving treatment success and life expectancy. Therefore, focusing on early diagnosis and treatment of breast cancer is of vital importance.[5] Regular mammography screenings, breast self-examinations (BSE), and clinical breast examinations are essential methods for early detection of breast cancer.[6]

Early detection remains one of the most critical factors that improves the prognosis of breast cancer; however, its effectiveness depends largely on individuals' levels of knowledge and awareness regarding the disease. Primary care and family medicine services play a pivotal role in this process, as they constitute the first point of contact for preventive counseling and timely referral. Strengthening first-step healthcare in routine breast cancer education can substantially increase women's screening participation, especially in socioeconomically disadvantaged communities.[7-10] In the literature, knowledge and awareness of breast cancer have been reported to be associated with various social determinants of health, such as age, income level, educational attainment, as well as geographic disparities and access to healthcare services.[11-18] However, most of these studies have assessed breast cancer knowledge and awareness with a limited set of social determinants.

Accordingly, the present study aimed to evaluate the knowledge and awareness levels of women receiving services from Cancer Early Diagnosis, Screening, and Training Centers (KETEM) located in two districts of Ankara – Çayyolu and Mamak – representing different socioeconomic levels, in relation to social determinants of health. Based on the Socioeconomic Development Ranking of Districts (SEGE) conducted by the Ministry of Industry and Technology of the Republic of Türkiye, which compares districts based on multidimensional indicators such as education, health, employment, income, and living conditions, Çankaya district ranks first among 25 districts in Ankara in terms of socioeconomic development, whereas Mamak ranks ninth.[19]

METHODS

This cross-sectional study included women aged 30–70 years who applied to KETEM, located in the Çayyolu neighborhood of Çankaya District and the Mamak Central neighborhood of Mamak District in Ankara Province. The necessary ethics committee approval and institutional permissions were obtained from the Ankara Yıldırım Beyazır University before conducting the study. The study is conducted according to Declaration of Helsinki. Participants were required to have no prior diagnosis of breast cancer and to be physically and mentally capable of completing the survey.

According to the Health Statistics Yearbook of Türkiye, 2023, the proportion of women performing BSE at least once every three months was reported as 29.8%, and those undergoing mammography at least once every three years was 19.8%.[3] The higher of these rates, the BSE rate, was used for sample size estimation. Using a 95% confidence interval (Z=1.96) and a 5% margin of error (d=0.05), with the event probability (p=0.298) and non-event probability (q=0.702), the minimum sample size was calculated as 322 participants.[20] Accordingly, data were collected from 210 voluntary women at Mamak KETEM and 158 women at Çayyolu KETEM, yielding a final sample of 368 participants.

The questionnaire consisted of two sections. The first section included 21 questions assessing sociodemographic characteristics, health service utilization, health status, history of cancer, and social determinants related to breast cancer awareness.[17,19,21] The second section comprised the breast cancer awareness scale (BCAS), developed by Rakkapao et al.[21] and adapted into Turkish by Altuntuğ et al.[22] The scale includes 35 items grouped under five subdimensions: Knowledge of risk factors for breast cancer (KRF; 9 items), knowledge of signs and symptoms (KSS; 8 items), attitudes toward breast cancer prevention (ABCP; 6 items), barriers to screening (BS; 4 items), and health behaviors related to breast cancer awareness (BCF; 8 items).

A Cronbach's alpha coefficient of 0.70 or higher indicates acceptable internal consistency for a scale.[20] The reliability coefficients were found as follows: KRF=0.895, KSS=0.973, ABCP=0.954, BS=0.774, BCF=0.789, and the overall scale=0.890, demonstrating that both the total scale and

its subdimensions were within the reliable or highly reliable range. Construct validity was assessed using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The EFA initially included all 35 items as in the original version; however, four items belonging to the BCF subdimension (Items BCF5, BCF6, BCF7, and BCF8) were excluded due to factor loadings below 0.30 and cross-loading patterns that weakened the conceptual clarity of the factor. After removal of these items, the revised 31-item version retained the original five-factor structure, with eigenvalues >1 and factor loadings above 0.30. The Kaiser–Meyer–Olkin (KMO) measure verified sampling adequacy (KMO=0.909>0.60), and Bartlett's test of Sphericity confirmed suitability for factor analysis (χ^2=10013.184; P≤0.001).

The CFA conducted with the refined 31-item structure demonstrated good/acceptable model fit (χ^2 [421]=961.766, p<0.001; minimum discrepancy/degrees of freedom=2.284; comparative fit index=0.945; Tucker-Lewis index=0.939; normed fit index=0.907; root mean square error of approximation=0.059), supporting the validity of the final model.

Ethical approval for the study was obtained from the Institutional Ethics Committee, and official permissions were granted by the relevant authorities before data collection. Data were collected through face-to-face interviews between November 2024 and February 2025. Descriptive statistics were presented as frequencies, percentages, means, and standard deviations. Normality was assessed using skewness and kurtosis coefficients, which are more appropriate for large samples. All BCAS subdimension scores showed acceptable normality, with skewness values ranging from –0.92 to +0.12 and kurtosis values ranging from –1.11 to +0.13, all within the commonly accepted ±1.5 interval. Therefore, the distributions were considered suitable for parametric analyses. To determine whether BCAS subdimension scores differed according to sociodemographic characteristics, independent samples t-tests were used for two-group comparisons and analysis of variance (ANOVA) for comparisons among more than two groups. Bonferroni *post hoc* tests were applied to identify the source of significant differences found by ANOVA. Relationships among BCAS subdimensions were examined using Pearson's correlation analysis. The study was designed and reported in accordance with the ICMJE and STROBE guidelines for observational studies. All statistical analyses were performed using IBM the Statistical Package for the Social Sciences Statistics, and a significance level of p<0.05 was adopted.

RESULTS

Table 1 presents the results of participants' responses regarding their individual characteristics and social determi-

Table 1. Descriptive characteristics of participants by district

Determinants	Mamak n (%)	Çayyolu n (%)
Age		
≤39	50 (23.8)	38 (24.1)
40–45	71 (33.8)	46 (29.1)
46–50	44 (21.0)	34 (21.5)
≥51	45 (21.4)	40 (25.3)
Education level		
Primary	81 (38.6)	24 (15.2)
Secondary	78 (37.1)	21 (13.3)
Associate/Bachelor and above	51 (24.3)	113 (71.5)
Marital status		
Married	183 (87.1)	111 (70.3)
Single/Divorced/Widowed	27 (12.9)	47 (29.7)
Number of children		
None	20 (9.5)	47 (29.7)
1	26 (12.4)	30 (19.0)
2	102 (48.6)	61 (38.6)
3	42 (20.0)	13 (8.2)
≥4	20 (9.5)	7 (4.4)
Employment status		
Retired	13 (6.2)	14 (8.9)
Not employed/Household work	129 (61.4)	42 (26.6)
Employed	68 (32.4)	102 (64.6)
Health worker in family		
Yes	50 (23.8)	52 (32.9)
No	160 (76.2)	106 (67.1)
Household income		
Income<expenses	81 (38.6)	28 (17.7)
Income>expenses	13 (6.2)	39 (24.7)
Income=expenses	116 (55.2)	91 (57.6)
Household size		
1 person	8 (3.8)	21 (13.3)
2 persons	13 (6.2)	34 (21.5)
3 persons	42 (20.0)	42 (26.6)
4 persons	91 (43.3)	48 (30.4)
≥5 persons	56 (26.7)	13 (8.2)
Home ownership		
Owned	160 (76.2)	118 (74.7)
Rented	50 (23.8)	40 (25.3)

Table 1. Continue

Determinants	Mamak n (%)	Çayyolu n (%)
Most frequently used healthcare type		
Public hospital	163 (77.6)	96 (60.8)
Private hospital/poly-clinic	9 (4.3)	49 (31.0)
University hospital	38 (18.1)	13 (8.2)
Unmet healthcare need (cost)		
Yes	83 (39.5)	44 (27.8)
No	127 (60.5)	114 (72.2)
Unmet healthcare need (access)		
Yes	60 (28.6)	39 (24.7)
No	150 (71.4)	119 (75.3)
Balanced diet		
Yes	128 (61.0)	131 (82.9)
No	82 (39.0)	27 (17.1)
Smoking status		
Quit	18 (8.6)	31 (19.6)
Never	112 (53.3)	85 (53.8)
Current	80 (38.1)	42 (26.6)
Alcohol use		
Quit	4 (1.9)	13 (8.2)
Never	179 (85.2)	91 (57.6)
Current	27 (12.9)	54 (34.2)
Chronic disease		
Yes	73 (34.8)	48 (30.4)
No	137 (65.2)	110 (69.6)
Family history of cancer		
Yes	78 (37.1)	54 (34.2)
No	132 (62.9)	104 (65.8)
Family history of breast cancer		
Yes	35 (16.7)	27 (17.1)
No	175 (83.3)	131 (82.9)
Breast ultrasound (ever)		
Yes	92 (43.8)	86 (54.4)
No	118 (56.2)	72 (45.6)
Breast ultrasound frequency		
Never	119 (56.7)	71 (44.9)
Annually	22 (10.5)	25 (15.8)
Every two years	25 (11.9)	20 (12.7)
Irregular	44 (21.0)	42 (26.6)
Education on breast cancer screening		
Yes	79 (37.6)	84 (53.2)
No	131 (62.4)	74 (46.8)
Total	210 (100.0)	158 (100.0)

Table 2. BCAS subdimension scores by district (ındependent samples t-test)

BCAS subdimension	District	Mean	SD	t	p
KRF	Mamak	1.94	0.56	−5.45	0.001
	Çayyolu	2.26	0.56		
KSS	Mamak	2.13	0.81	−6.97	0.001
	Çayyolu	2.66	0.57		
ABCP	Mamak	3.47	1.25	−3.66	0.001
	Çayyolu	3.90	0.93		
BS	Mamak	3.61	0.99	−1.65	0.099
	Çayyolu	3.78	0.89		
BCF	Mamak	2.59	0.97	−4.89	0.001
	Çayyolu	3.12	1.10		

BCAS: Breast cancer awareness scale, KRF: Knowledge of risk factors, KSS: Knowledge of signs and symptoms, ABCP: Attitudes toward breast cancer prevention, BS: Barriers to screening, BCF: Breast Cancer Awareness

The relationships among the BCAS subdimensions were evaluated using correlation analysis, and the results are presented in Table 4. According to these findings, a strong and statistically significant positive correlation was found between KRF and KSS ($r=0.652$, $p<0.01$). Weak to very weak but significant positive correlations were observed between KRF and ABCP ($r=0.165$, $p<0.01$) and between KRF and BCF ($r=0.216$, $p<0.01$). Similarly, KSS showed weak to very weak positive correlations with ABCP ($r=0.205$, $p<0.01$) and BCF ($r=0.178$, $p<0.01$). A weak positive correlation was also identified between BS and BCF ($r=0.320$, $p<0.01$). No statistically significant correlations were found among the other pairs of subdimensions ($p>0.05$).

DISCUSSION

This study evaluated the relationship between social determinants of health and breast cancer knowledge and awareness among women living in two districts of Ankara with distinct socioeconomic profiles. The findings indicated significant differences in breast cancer knowledge and awareness according to social determinants of health. Women residing in Çayyolu scored significantly higher than those in Mamak across the KRF, KSS, ABCP, and BCF subdimensions, reflecting the positive influence of higher socioeconomic status on access to information, health literacy, and preventive health behaviors. These results are consistent with the findings reported in the literature. Üçüncü et al.[16]

Table 3. Differences in BCAS subdimensions by social determinants (t-test/ANOVA)

Determinants	KRF	KSS	ABCP	BS	BCF
Education level	Associate/Bachelor+>Primary*	Associate/Bachelor+>Secondary>Primary*	Associate/Bachelor+>Primary*	—	Associate/Bachelor+>Primary*
Marital status	Single/Divorced/Widowed>Married*	Single/Divorced/Widowed>Married*	—	—	—
Number of children	—	1>3*	None>≥4*	—	None>2>3>≥4*
Employment status	Employed>Not employed//Household work*	Employed>Not employed//Household work*	Employed>Not employed//Household work*	—	Employed>Not employed//Household work*
Health worker in family	Yes>No*	Yes>No*	—	—	Yes>No*
Household income	—	—	—	Income=Expenses>Income<Expenses*	Income>Expenses>Income<Expenses*
Household size	—	—	—	—	2 persons>≥5*
Home ownership	—	—	—	—	Owned>Rented*
Smoking status	Current<Quit/Never*	—	—	—	—
Unmet need (cost)	—	—	Yes<No*	Yes<No*	—
Unmet need (access)	—	—	—	Yes<No*	—
Balanced diet	—	—	—	—	Yes>No*
Chronic disease	—	—	—	—	No>Yes*
Breast ultrasound (ever)	Yes>No*	Yes>No*	—	Yes>No*	Yes>No*
Education on breast cancer screening	Yes>No*	Yes>No*	Yes>No*	Yes>No*	Yes>No*

*p<0.05; "—" = not significant; ">" indicates higher mean score. BCAS: Breast cancer awareness scale, ANOVA: Analysis of variance, KRF: Knowledge of risk factors, KSS: Knowledge of signs and symptoms, ABCP: Attitudes toward breast cancer prevention, BS: Barriers to screening, BCF: Breast Cancer Awareness

Table 4. Correlations among BCAS subdimensions (Pearson)

	KRF	KSS	ABCP	BS	BCF
KRF	1				
KSS	0.652**	1			
ABCP	0.165**	0.205**	1		
BS	0.037	0.074	−0.067	1	
BCF	0.216**	0.178**	0.020	0.320**	1

**p<0.01; *p<0.05. BCAS: Breast cancer awareness scale, KRF: Knowledge of risk factors, KSS: Knowledge of signs and symptoms, ABCP: Attitudes toward breast cancer prevention, BS: Barriers to screening, BCF: Breast Cancer Awareness

also reported that women living in urban areas with higher education and income levels had significantly greater awareness and more regular participation in early detection practices. Similarly, Kim and Kang found that women with higher income and education levels were significantly more likely to participate in national cancer screening programs, whereas screening access was limited among lower socioeconomic groups.[23]

Sociodemographic variables such as education, marital status, income, and employment status were significantly associated with awareness levels, indicating that awareness is influenced not only by individual knowledge but also by social environment and living conditions. Within Marmot's framework of social determinants, education and economic status shape individuals' health behaviors.[24] In line with this, Jensen et al.[13] reported that in West Texas, women with lower income and without health insurance had lower screening rates and higher rates of late-stage diagnosis. Similarly, Lee et al.[8] and Kolahdooz et al.[25] found that women with higher income and educational attain-

ment were more likely to participate in mammography screening and to engage in early detection behaviors. In this study, awareness levels were higher among single and employed women, suggesting that social participation and individual health responsibility are positively associated with knowledge and awareness. Ghanbari et al.[7] similarly reported that social support and financial independence enhanced screening behaviors, while awareness was weaker among low-income and housewife groups. Conversely, lower awareness levels observed among women with three or more children may be explained by both the financial burden and time constraints limiting healthcare engagement. These results are consistent with the findings of Rezaeimanesh et al.[15], who reported that socioeconomic status and living conditions influence mammography behavior.

However, it should also be acknowledged that the relationship between socioeconomic status and breast cancer awareness is not unidirectional. Several studies have reported that even among women with higher education or income levels, screening participation may remain suboptimal due to perceived invulnerability, competing life responsibilities, cultural attitudes, or low perceived risk.[17,26] For instance, some research has shown that socioeconomic advantage does not always translate into preventive health behaviors, and structural barriers can persist across all socioeconomic groups.[27] These findings suggest that while socioeconomic resources facilitate awareness, individual perceptions, cultural norms, and health system barriers may moderate this relationship.

Higher awareness scores among women who had undergone breast ultrasound and participated in educational programs indicate that increased knowledge translates into behavioral change. Açıkgöz et al.[6] demonstrated that structured education programs improved screening behaviors, while Tahergorabi et al.[12] showed that knowledge levels significantly predicted both mammography and clinical breast examination practices. These findings support the notion that educational interventions are effective not only for improving knowledge but also for promoting behavioral outcomes. However, the absence of a significant difference between the two groups in the BS subdimension suggests that increased knowledge does not necessarily result in behavioral change. Similarly, Miller et al.[14] noted that women facing adverse social determinants – such as limited transportation, social isolation, and financial stress – had significantly lower mammography participation rates. This finding highlights that behavioral change requires addressing environmental and psychological barriers in addition to cognitive knowledge.

The strong positive correlation between KRF and KSS observed in this study demonstrates that the components of knowledge and awareness complement one another. Seyedkanani et al.[10] also reported that women with higher risk awareness were nearly twice as likely to recognize early symptoms, underscoring the importance of integrating comprehensive knowledge. Mohammadnabizadeh et al.[9] further indicated that lifestyle factors such as non-smoking, physical activity, and healthy nutrition strongly predict mammography participation, emphasizing the need to address healthy lifestyle behaviors in conjunction with awareness programs. The lower awareness scores among smokers and women with chronic illnesses in the present study directly support this relationship.

This study has several limitations. First, although statistically significant associations were observed, the cross-sectional design allows only the identification of relationships rather than causal effects. In other words, temporal ordering cannot be established, and statistically significant findings should not be interpreted as evidence of causation. Second, the sampling strategy relied on voluntary participation among women who applied to KETEM services, which may introduce selection bias, as women who actively seek preventive care may differ from those who do not. Third, the study relied on self-reported data for variables such as health behaviors and previous screening practices, which may be subject to recall bias and social desirability bias. Fourth, although the BCAS has established validity, the exclusion of four items during the EFA process and the cultural context of the population may have influenced the measurement structure. Fifth, the unequal number of participants between the two districts reflects natural utilization patterns of KETEM services and may have affected subgroup comparisons despite the use of robust statistical methods. Finally, the study was conducted in only two districts of Ankara, limiting the generalizability of the findings to other regions with different sociodemographic or cultural characteristics. Nonetheless, the findings contribute valuable descriptive insights to the existing literature on breast cancer awareness in Türkiye.

CONCLUSION

This study demonstrates that social determinants of health are significantly associated with women's knowledge and awareness levels regarding breast cancer. Socioeconomic factors such as education, income, and employment status, along with health status and access to healthcare services, are key determinants of awareness. The higher awareness levels observed among women who received information and screening education highlight the effectiveness of ed-

ucational interventions. However, the persisting inadequacy in early detection behaviors suggests that psychosocial and cultural factors also play a crucial role in transforming knowledge into practice.

The findings indicate that developing accessible, sustainable, and culturally tailored awareness programs for women living in socioeconomically disadvantaged regions should be among the primary objectives of national health policies for combating breast cancer in Türkiye. In this context, primary healthcare services and family medicine play a pivotal role, as they constitute the first point of contact for preventive counseling, early detection guidance, and referral. Strengthening the integration between KETEM and family medicine units can enhance community-based outreach and facilitate equitable access to screening services. Furthermore, it is recommended that the planning of KETEM services consider not only population density but also socioeconomic status. Future research should employ longitudinal study designs to examine the causal relationships between social determinants and breast cancer awareness and to evaluate the effectiveness of intervention programs aimed at improving awareness levels.

Disclosures

Peer-review: Externally peer-reviewed
Conflict of Interest: None declared
Funding: The authors received no financial support for this study
Ethics Committee Approval: The study was approved by the Ankara Yıldırım Beyazı University Ethics Committee (Date: 22/11/2023, No: 09-213)
Authorship Contributions: Concept – O.D., K.A.; Design – O.D., K.A.; Supervision – K.A., S.D.; Funding – O.D.; Materials – O.D.; Data collection and/or processing – O.D.; Analysis and/or interpretation – S.D.; Literature search – O.D.; Writing – O.D., S.D.; Critical review – O.D., K.A., S.D.

REFERENCES

1. World Health Organization. Cancer fact sheet. Available at: https://www.who.int/news-room/fact-sheets/detail/cancer. Accessed 14 Oct, 2025.
2. McCart Reed AE, Kalinowski L, Simpson PT, Lakhani SR. Invasive lobular carcinoma of the breast: The increasing importance of this special subtype. Breast Cancer Res 2021;23(1):1–16.
3. Ministry of Health of the Republic of Türkiye. Health Statistics Yearbook, 2023. Available at: https://dosyasb.saglik.gov.tr/Eklenti/50500/0/siy202307032025pdf. Accessed 14 Oct, 2025.
4. International Agency for Research on Cancer. Global Cancer Observatory: Cancer Today. World Health Organization (WHO). Available at: https://gco.iarc.fr/today/en. Accessed 14 Oct, 2025.
5. Harkness EF, Astley SM, Evans DG. Risk-based breast cancer screening strategies in women. Best Pract Res Clin Obstet Gynaecol 2020;65:3–17.
6. Açıkgöz A, Çehreli R, Ellidokuz H. Determination of knowledge and behavior of women working at a hospital on breast cancer early detection methods, and investigation of efficiency of planned education. J Breast Health 2015;11(1):31–8.
7. Ghanbari A, Rahmatpour P, Hosseini N, Khalili M. Social determinants of breast cancer screening among married women: A cross-sectional study. J Res Health Sci 2020;20(1):e00467
8. Lee YS, Roh S, Moon H, Lee KH, McKinley C, LaPlante K. Andersen's Behavioral Model to identify correlates of breast cancer screening behaviors among Indigenous women. J Evid Based Soc Work 2020;17(1):117–35.
9. Mohammadnabizadeh S, Farkhani EM, Talkhi N. Predictive factors of breast cancer mammography screening among Iranian women. J Prev Med Hyg 2024;64(4):448–56.
10. Seyedkanani E, Hosseinzadeh M, Mirghafourvand M, Sheikhnezhad L. Breast cancer screening patterns and associated factors in Iranian women over 40 years. Sci Rep 2024;14(1):1–9.
11. Stephanopoli JP, Bouazzi L, Guerbaz-Sommi M, Graesslin O, Hurtaud A, Ilardo S, et al. Factors associated with deferral or non-performance of an organized breast cancer screening program during the COVID-19 pandemic in France. Cancer Med 2024;13(16):e7444
12. 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(1):102.
13. Jensen B, Khan H, Layeequr Rahman R. Sociodemographic determinants in breast cancer screening among uninsured women of West Texas. Medicina (Kaunas) 2022;58(8):1010.
14. Miller JW, King JA, Trivers KF, Town M, Sabatino SA, Puckett M, et al. Vital Signs: Mammography use and association with social determinants of health and health-related social needs among women — United States, 2022. MMWR Morb Mortal Wkly Rep 2024;73(15):351–7.
15. Rezaeimanesh M, Solhi M, Azar FEF, Sajjadi H, Rafiey H, Nejad FN, et al. Determinants of mammography screening in Tehranian women in 2018 based on the health belief model: A cross-sectional study. J Educ Health Promot 2021;10:119.
16. Üçüncü MZ, Üçüncü MM, Toprak D. Evaluation knowledge, attitude, and behaviour for breast cancer among young women living in two different habitats of Turkey. Asian Pac J Cancer Prev 2018;19(11):3179–85.
17. Jhumkhawala V, Lobaina D, Okwaraji G, Zerrouki Y, Burgoa S, Marciniak A, et al. Social determinants of health and health inequities in breast cancer screening: A scoping review. Front Public Health 2024;12:1354717.
18. Rolle LSD, Chery MJ, Larson M, Lopez-Pentecost M, Calfa CJ, Schlumbrecht MP, et al. The effect of disability and so-

cial determinants of health on breast and cervical cancer screenings during the COVID-19 pandemic. Prev Chronic Dis 2024;21:E05.
19. Ministry of Industry and Technology of the Republic of Türkiye. Research on the Socio-Economic Development Ranking of Districts SEGE-2022. Available at: https://www.sanayi.gov.tr/assets/pdf/birimler/2022-ilce-sege.pdf. Accessed 14 Oct, 2022.
20. Karagöz Y. SPSS and AMOS applied statistical analyses. Ankara: Nobel Academic Publishing; 2019.
21. Rakkapao N, Promthet S, Moore MA, Hurst CP. Development of a Breast Cancer Awareness Scale for Thai women: Moving towards a validated measure. Asian Pac J Cancer Prev 2016;17(2):851–6.
22. Altuntuğ K, Koçak V, Ege E. The evaluation of the validity and reliability of the Breast Cancer Awareness Scale (for Turkish women). Turk J Oncol 2021;36(2):154–64.
23. Kim JY, Kang HT. Association between socioeconomic status and cancer screening in Koreans over 40 years in age based on the 2010–2012 Korean National Health and Nutrition Examination Survey. Korean J Fam Med 2016;37(5):287–92.
24. Marmot M. Social determinants of health inequalities. Lancet 2005;365(9464):1099–104.
25. Kolahdooz F, Jang SL, Corriveau A, Gotay C, Johnston N, Sharma S. Knowledge, attitudes, and behaviours towards cancer screening in indigenous populations: A systematic review. Lancet Oncol 2014;15(11):504–16.
26. Patil P, Sarang B, Bhandarkar P, Ghoshal R, Roy N, Gadgil A. Does women's empowerment and their socioeconomic condition affect the uptake of breast cancer screening? Findings from NFHS-5, India. BMC Womens Health 2023;23(1):7.
27. Ozcinar B, Aribal E, Cabioglu N, Gurdal SO, Varol G, Akyurt N, et al. Long-term outcomes of Türkiye's first population-based mammography screening program: A decade of breast cancer detection and survival analysis in Bahçeşehir. BMC Womens Health 2025;25(1):5.