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ORIGINAL RESEARCH PERIOPERATIVE MEDICINE

# Understanding the perceptions and attitudes of Saudi women towards mammography

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## ABSTRACT

**Objectives:** Breast cancer (BC) is one of the leading cause of morbidity and mortality among women worldwide. Mammography remains the main screening tool for BC. However, despite its effectiveness, the percentage of women undergoing early mammography is very low; leading to more patients presenting at advanced stages of cancer. The objective of this study was to investigate the perceptions and attitudes of Saudi women towards mammography as a screening tool for BC.

**Methodology:** This cross-sectional study included 309 women residents of Arar City, above 18 years of age and was conducted in the College of Medicine, Northern Border University, Arar, Kingdom of Saudi Arabia, from August 1,2024 to September 30, 2024. All participants were asked to complete a pre-designed questionnaire. The questionnaire was thoroughly validated and reviewed by two consultants for content validity. The received back responses were then converted to Google Form and distributed online to the participants through WhatsApp. Data was analyzed using SPSS version 29.0, and a P-value of ≤ 0.05 was considered significant.

**Results:** The results indicated a significant relationship between Saudi women's perceptions and attitudes towards mammography and their engagement with the procedure. The regression sum of squares was 54.757, with 8 degrees of freedom, yielding a mean square of 6.845. The F-value was 2174.447, which was highly significant, with $P < 0.001$.

**Conclusion:** This study highlights the significant role that Saudi women's perceptions and attitudes towards mammography play in influencing their engagement with the procedure as a critical tool for BC screening.

**Keywords:** breast cancer, mammography, Saudi women, screening, perception, attitude

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## 1. INTRODUCTION

Breast cancer (BC) is the leading cause of morbidity and mortality among women worldwide. BCs are responsible for more than 25% of all cancer incidence worldwide.[1] In Saudi Arabia, BC accounted for almost 31% of all cancers in women in 2017, affecting more than 24,000 women every year. In 2019, it became the ninth most common cause of mortality in women.[2] Mammography, a radiographic examination of the breast, remains the basic tool used for BC screening in healthy adult women. It takes images of the breast soft tissue using low-dose radiations.[3] Mammography can detect BC at least 2 years prior to the emergence of any signs and symptoms, thereby significantly reducing BC death rates.[4] However, despite its benefits, the percentage of women undergoing mammography is low, leading to more patients presenting at advanced stages of cancer.

A mammogram can detect BC or even carcinoma in situ of sizes 5–10 mm in diameter.[5] It decreases the risk of BC-related mortality by 25%–30%. The American Cancer Society recommends annual mammograms to screen BC in women above the age of 40 years. Similarly, the Saudi National Campaign for BC detection includes screening with mammography for women above the age of 40 years.[6] However, studies across the United Arab Emirates found that women have limited

 

knowledge regarding BC. Precisely, 92% of women aged 50–74 years have never undergone or avoided mammography examinations.[7] Other studies have also shown that only 40% of the population in Saudi Arabia had undergone a mammogram, with only 8% from the risk-prone age group.[8] Alananzi et al. reported a similar finding, wherein only <50% of the participants knew about mammograms.[9] In another study, only 13.8% of the participants demonstrated an acceptable level of knowledge of mammography. These might be the reasons underlying the increasing BC incidence.

According to the participants in these studies, the most common personal barriers towards mammogram screening were fear of cancer diagnosis, fear of the examination itself, and fear of pain.[10] There are, however, additional barriers, such as lack of awareness, lack of insurance coverage, high screening costs, anxiety, and cultural differences. Some have even reported fear of mammography rays.[11] Cultural perceptions regarding health, femininity, and BC can significantly influence attitudes toward screening.[12] Furthermore, personal beliefs regarding health risks, prevention, and the significance of early detection can also influence women's perception and knowledge of mammography.

In examining Saudi women's knowledge, attitudes, and perceptions towards mammography, several gaps were identified in the literature. Research exploring how cultural beliefs and practices specifically shape women's attitudes towards mammography in different regions of Saudi Arabia is limited. In addition, there are limited studies evaluating the effectiveness of educational programs tailored to increase awareness of and encourage mammography screening among diverse populations.[13] Furthermore, there is insufficient qualitative data on personal and systemic barriers that hinder access to mammography services. Few longitudinal studies have tracked changes in knowledge and attitudes over time, particularly in response to public health campaigns.[14] Lastly, the influence of digital health resources and social media on women's perceptions and knowledge of mammography is not well-explored.

The objective of this study was to investigate the perceptions and attitudes of Saudi women towards mammography as a screening tool for BC.

## 2. METHODOLOGY

This cross-sectional study was conducted in the College of Medicine, Northern Border University, Arar, Kingdom of Saudi Arabia, between August 1 and September 30, 2024. The sample size was calculated as 309 women by taking a 95% confidence level, a 5.5% margin of error, and an expected percentage of satisfaction with mammography as 58.1%.[15]. The Local Committee of Bioethics approved the study via decision number 3/24/H, and informed consent was obtained The participants were selected using a convenient sampling technique, and specific inclusion and exclusion criteria were designed. The inclusion criteria were Saudi women residents of Arar City, above the age of 18 years, and consented to the study. The exclusion criteria were participants who failed to provide consent, women residing in areas other than Arar City, and non-Saudi women residing in Arar City.

Data was collected on a pre-designed proforma. The questionnaire was thoroughly validated to ensure its reliability and relevance. A literature review was conducted to identify key constructs and dimensions pertinent to the study. This informed the development of the questionnaire items, which were then subjected to further review by two consultants for content validity. Feedback from experts was incorporated into the questionnaire to ensure clarity and alignment with the research objectives. Following this, a pilot study including 20 participants was conducted, thus allowing for the collection of preliminary data and an assessment of the clarity and comprehensibility of each item. Based on the pilot results, further adjustments were made to enhance the questionnaire's effectiveness. It was then converted to Google Form and distributed online to the participants through WhatsApp. All the participants were asked to complete a pre-designed questionnaire. Each question was separately analyzed.

All the data was entered and analyzed using Statistical Package for Social Sciences Software version 29.0. The normality of the data was checked using the Shapiro–Wilk test. Qualitative variables were presented in the form of frequency and percentages, whereas quantitative variables were presented in the form of mean + standard deviation. Analysis of variance (ANOVA) test was performed to assess the association between the perceptions and attitudes of Saudi women towards mammography and their engagement with the procedure. $P \leq 0.05$ was considered statistically significant. Confounders such as age and marital status were ruled out using stratification.

## 3. RESULTS

In a sample of 309 participants, the majority of the women fell in the 20–30 years bracket [154 (49.8%)], followed by 78 (25.2%) aged 41–50 years, and 43 (13.9%) aged 31–40 years (Table 1). Regarding marital status, 163 (52.7%) were single, 107 (34.6%) were married, 17 (5.5%) were divorced, and 22 (7.1%) were widowed. Regarding employment status, 197 participants were employed (63.7%), whereas 112 were unemployed (36.2%). Family history of BC was positive in 73 (23.6%) participants. (Table 1). Regarding

 

**Table 1: Demographic features of the study population *(N = 309)***

| Variables | Category | n (%) |
|---|---|---|
| **Age (years)** | 20-30 | 154 (49.8) |
| | 31-40 | 43 (13.9) |
| | 41-50 | 78 (25.2) |
| | 51-60 | 19 (6.1) |
| | > 60 | 15 (4.85) |
| **Marital status** | Single | 163 (52.7) |
| | Married | 107 (34.6) |
| | Divorced | 17 (5.5) |
| | Widow | 22 (7.1) |
| **Employed** | Yes | 197 (63.7) |
| | No | 112 (36.2) |
| **Family history of breast cancer** | Yes | 73 (23.6) |
| | No | 236 (76.25) |

mammography awareness, 47.55% correctly identified mammography as the most effective screening tool for early BC detection, whereas 52.45% either answered incorrectly or were unaware. Only 42.7% acknowledged that mammography was safe, whereas 57.2% expressed uncertainty or incorrect beliefs. A greater portion, 58.2%, recognized that annual mammography was the most effective method for diagnosing disease, while 32% did not. In addition, 51.05% agreed that mammography

**Table 2: Attitude of Saudi women about mammographic screening (n = 309)**

| Variable | Response | n (%) |
|---|---|---|
| **History of mammography** | Yes | 74 (23.95) |
| | No | 235 (76.03) |
| **Frequency of mammography** | One time | 24 (7.76) |
| | Annually | 13 (4.20) |
| | Every two year | 5 (1.62) |
| **Factor leading to refusal from mammography** | Long distance from facility | 10 (3.23) |
| | Transportation problem | 6 (1.94) |
| | Stress/anxiety | 153 (49.51) |
| | Fear of diagnosis | 34 (10.99) |
| | Pain during procedure | 27 (8.74) |
| | shyness | 31 (10.03) |
| | Pressure on chest | 2 (0.65) |
| | Fear of machine | 8 (2.59) |

reduced BC-related morbidity and mortality, whereas 48.8% disagreed or were unsure. When asked about the ability of mammograms to detect a mass before it is large enough to feel, only 36.2% were correct, with 63.7% responding negatively or uncertainly. Furthermore, 24.2% understood that some chronic diseases can hinder BC detection through mammography, while 75.7% did not. Misconceptions were also observed; 12.6% believed mammography could cause BC in those who do not have it, while 66.9% thought otherwise. Lastly, 18.8% perceived mammography to be a painful procedure, leaving 81.1% either disagreeing or unsure (Figure 1). Of the 309 participants, only 74 (23.95%) had undergone the procedure, while the significant majority, 235 (76%), did not. When examining the frequency of mammography, only 24 participants (7.8%) reported having it done once, 13 (4.2%) annually, and only 5 (1.6%) every 2 years.

Several factors contributed to the refusal of mammography; however, stress and anxiety were notably the most significant barriers, as reported by 153 participants (49.5%). Other reasons included fear of diagnosis (10.9%), fear of pain during the procedure

(8.7%), shyness (10%), transportation issues (such as long distance to screening facilities) (3.2%), and conveyance issues (1.9%). In addition, a small number expressed concerns regarding chest pressure (0.65%) and fear of the machine (2.6%) used. This data underscored the critical barriers that affect Saudi women's willingness to participate in mammography screening (Table 2). In the ANOVA for the regression model predicting mammography, the results indicated a significant relationship between the predictors and the dependent variable. The regression sum of squares was 54.757, with 8 degrees of freedom, yielding a mean square of 6.845. The F-value was 2174.447, which was highly significant, with $P < 0.001$. This suggested that the model, which included the predictors Q1 through Q8, significantly explained the variance in mammography outcomes. The residual sum of squares was 0.941, indicating that the model accounted for a substantial proportion of the variability in the data. Overall, the results confirmed that the chosen predictors collectively had a significant impact on the women's perceptions and attitudes towards mammography.

## 4. DISCUSSION

The participants' demographic data revealed key insights into the study population. A significant portion of the participants (49.84%) were between 20 and 30 years of age, suggesting that younger individuals were more represented in the sample. Marital status indicated that >50% of the participants were single (52.73%), which could influence social and health-related behaviors,

 

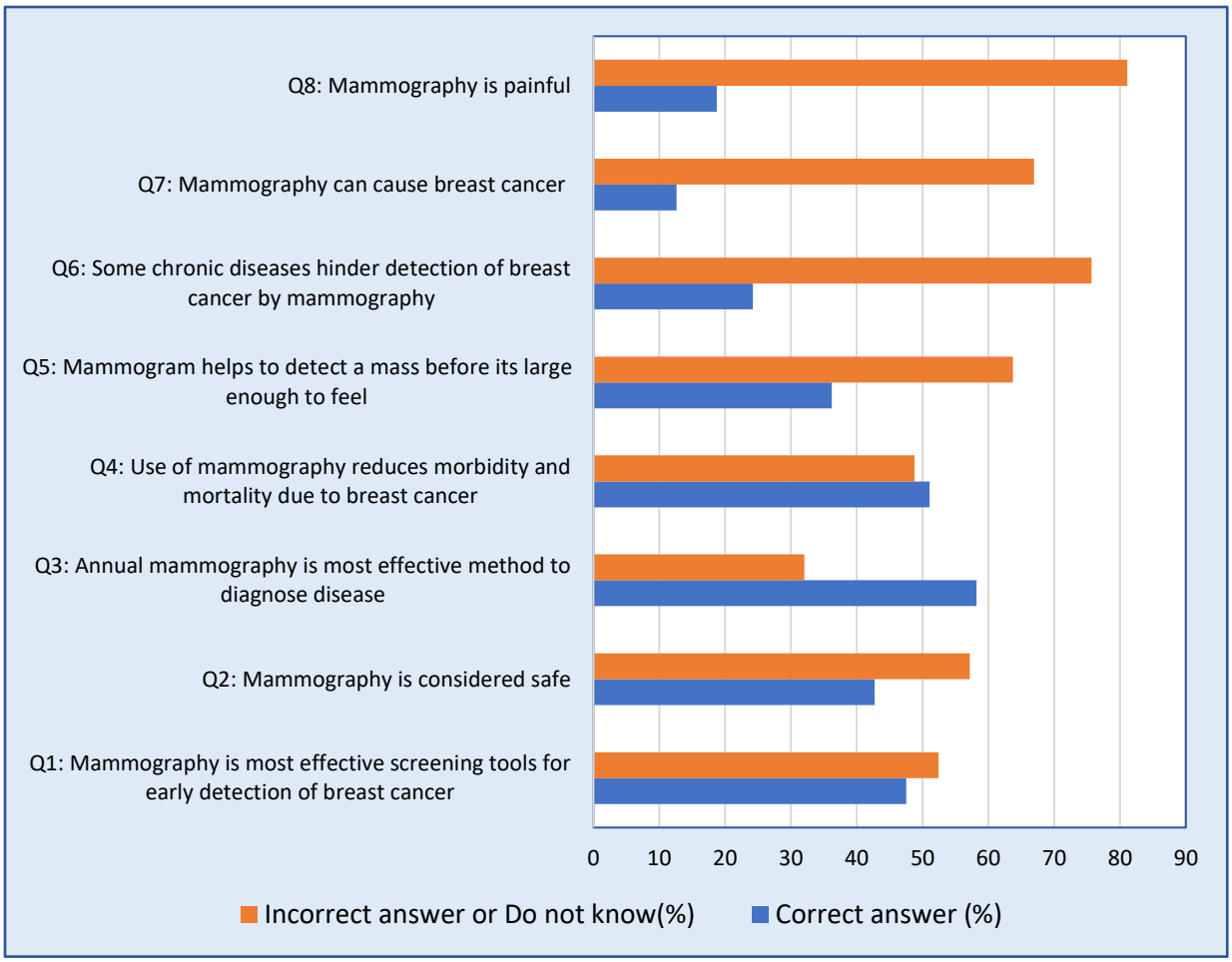


**Figure 1: Perception of Saudi women about mammography as a screening tool for breast cancer (%)**

including attitudes toward healthcare access. The employment rate was relatively high, with 63.74% employed, suggesting that economic stability could also be an important factor in the participants' health decisions and access to mammography, in line with Icanervilia et al.'s study.[16] Family history of BC was reported in 23.59% of the participants, highlighting a potential risk factor within the population. While this figure indicated that the majority do not have a family history, those who might do require targeted education and screening interventions.[17]

The data on participants' knowledge and perceptions of mammography revealed several critical insights that can guide public health interventions and educational initiatives. With only 47.55% of participants correctly identifying mammography as the most effective screening tool for early detection of BC, there is a clear need for enhanced educational outreach. These findings correlated with another study, which revealed that Saudi

**Table 3: ANOVA summary table for the regression model predicting mammography, highlighting the significance of the predictors (Q1-Q8) with a High F-value and P < .001.**

| No. | Model | Sum of Squares | df | Mean Square | F | P value |
|---|---|---|---|---|---|---|
| 1 | Regression | 54.757 | 8 | 6.845 | 2174.447 | < .001b |
| 2 | Residual | .941 | 299 | .003 | | |
| 3 | Total | 55.698 | 307 | | | |

a. Dependent Variable: mammography

b. Predictors: (Constant), Q8, Q3, Q5, Q7, Q1, Q6, Q2, Q4

 

women have limited knowledge regarding BC and mammography.[18] The perception of mammography as unsafe, with only 42.71% acknowledging its safety, is indeed concerning. Furthermore, the fact that only 58.22% recognized the importance of annual mammography underscores the need to develop clear messages regarding screening guidelines. Educational efforts should target the significance of regular screenings to improve early detection rates. The low percentage (36.23%) of participants who were aware that mammograms can detect masses before they become palpable indicates a fundamental misunderstanding of the screening's benefits. Educational initiatives should clarify the advantages of early detection through mammography. The majority (75.68%) were also unaware that chronic diseases can hinder BC detection. This knowledge gap could be critical, as individuals with chronic conditions may need tailored advice regarding their screening schedules. Furthermore, the belief that mammography can cause BC was notably high, with 66.96% holding this misconception. Similarly, another study revealed that 67.4 % of women avoided undergoing mammography due to fear of radiation exposure.[19] The overwhelming majority (81.12%) either believed that mammography was not painful or were unsure about its discomfort, indicating a potential disconnect between personal experiences and public perceptions. Educational campaigns could also focus on providing realistic expectations regarding discomfort during the procedure to reduce anxiety.

The data on participants' attitudes toward mammography revealed that a striking 76.03% of them never underwent a mammogram, indicating the presence of significant barriers to BC screening in this population. Similarly, another study found that nearly 50% of Saudi women never underwent a mammogram.[20] This low participation rate reflects the existence of underlying issues such as lack of information, perceived necessity, or accessibility challenges. Among those who had undergone mammography, the frequency was alarmingly low. Only 7.76% had undergone the procedure once, and a mere 4.20% reported annual screenings. Even fewer (1.62%) had mammograms every 2 years. This not only suggested that few individuals were engaged in regular screenings but also those who participated did so infrequently, thus undermining the efficacy of early detection strategies.[21] As reported by 49.51% of the participants, stress and anxiety were the most predominant concerns, indicating that psychological factors play a significant role in deterring individuals from seeking screening. Others included fear of cancer diagnosis (10.99%) and pain during the procedure (8.74%), both of which reflect common anxieties associated with medical screenings. Next were logistical barriers, such as long distance to screening facilities (3.23%), and transportation issues (1.94%), although these appear less significant compared to psychological factors. According to Zohre et al., concerns such as shyness (10.03%) and fear of the machinery (2.59%) were also observed, indicating that social and personal apprehensions affected participation.[22] These findings indicated that outreach initiatives should not only focus on education about mammography but also create a supportive environment that addresses emotional and social barriers. The present study also recommends the implementation of comprehensive educational programs that address the identified knowledge gaps and misconceptions, and these should be tailored according to various demographics to maximize outreach effectiveness.[23] It supports the collaboration with healthcare providers, community leaders, and BC survivors to deliver messages regarding the importance and safety of mammography. Multimedia resources, including videos and infographics, explaining the mammography process, benefits, and safety to demystify the procedure should be encouraged.[24] A feedback mechanism must be created for participants to share their concerns and experiences related to the procedure, allowing for continuous improvement in educational initiatives.

## 5. LIMITATIONS

This study has several limitations that should be acknowledged. First, self-reported data may be subjected to bias, as participants might underreport negative attitudes or overreport positive ones due to social desirability. The study's findings may not be generalizable beyond the specific context of Saudi Arabia, as cultural and societal factors can vary significantly across different regions. Hence, addressing these limitations in future research could provide a more comprehensive understanding of the factors influencing mammography screening among women in Saudi Arabia and similar contexts.

## 6. CONCLUSION

This study highlights the significant role that perceptions and attitudes play in influencing Saudi women's engagement with mammography as a critical tool for BC screening. The findings reveal prevalent misconceptions, emotional barriers, and logistical challenges that contribute to low screening rates among this population. By identifying stress, anxiety, and fear as primary deterrents, the study underscores the need for targeted educational initiatives that address these concerns while promoting the benefits of early detection.

### 7. Data availability

 

The numerical data generated during this research is available with the authors.


### 8. Acknowledgement

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### 9. Conflict of interest

The study utilized the hospital resources only, and no external or industry funding was involved.

### 10. Authors' contribution

Pakeeza Safiq was the sole researcher and the author of this paper.

## 11. REFERENCES


1. Kalakattawi RM, Alsufyani MO, Elkhouly TH, Algahtany FI, Raza SQ. Obstacles and awareness of mammography screening among Saudi women attending King Abdulaziz Specialist Hospital in Taif city, Saudi Arabia. IJMDC. 2022; 6(6): 785-792. doi:10.24911/IJMDC.51-1632991249
2. Alrossais AA, Alshihri MA, Alsubaihi NS, Almoheteb LM, Bakhiet HM, Hassanein MH. Satisfaction and Experience of Women with Breast Cancer Screening Services in Riyadh, Saudi Arabia. Mater Sociomed. 2023;35(2):129–134. doi: 10.5455/msm.2023.35.129-134
3. Rahim A, Rasheed B, Adil SO, Naz N, Aslam N. Effective strategy to cope the pain and discomfort among women undergoing mammography-A randomized controlled trial. Pak J Med Sci. 2023 Sep-Oct;39(5):1422-1428. PMCID: PMC10480745 DOI: 10.12669/pjms.39.5.7500
4. Pillay RM. Mammography health beliefs and awareness levels among females working at a higher education institution in South Africa (Doctoral dissertation, Cape Peninsula University of Technology). https://etd.cput.ac.za/handle/20.500.11838/3492
5. Al-Mulhim FA, 2001. Knowledge and attitude towards screening mammography among 400 women in the Eastern province of Saudi Arabia. J Family Community Med. 2001 Sep;8(3):73-8. DOI: 10.4103/2230-8229.98066
6. Gouse HSM, Mohammed S, Wahid A, Al Gaedy R, Al Ahdal DA, Katib GA, et al. Perception, attitude and experience of women living in Jeddah with or without Breast lump towards BSE & mammography: Pre-Post study. Medical Science, 2022, 26, ms63e2060. DOI: https://doi.org/10.54905/disssi/v26i120/ms63e2060
7. Aldhafeeri FM. Knowledge and Attitudes of Breast Cancer, Breast Self Examination and Mammography among Female Students in Saudi Arabia. Indian Journal of Public Health Research & Development. 2020 Oct 21;11(11):292-8. DOI: https://doi.org/10.37506/ijphrd.v11i11.11387
8. Al-Wassia RK, Farsi NJ, Merdad LA, Hagi SK. Patterns, knowledge, and barriers of mammography use among women in Saudi Arabia. Saudi Med J. 2017 Aug;38(9):913-921. PMCID: PMC5654025 DOI: 10.15537/smj.2017.9.20842
9. Alanazi MF, Thirunavukkarasu A, Alrowily M, Alaqel N, Alaqel A, Alruwaili M, Alazmi NN, Alhassan O, Aljarallah MF, Altaymani AM. A Cross-Sectional Evaluation of Knowledge About Breast Cancer and Perceived Barriers to the Uptake of Mammogram Screening Among Northern Saudi Women: A Population-Based Study. Breast Cancer: Targets and Therapy. 2023 Dec 31:451-60.
10. Raza SQ, Reem MK, Maha OA, Alqahtani F. Obstacles and Awareness of Mammography Screening (MS) Among Saudi Women Attending. Age.;41(50):51-60.
11. Dezham S, Roozbahani N, Khorsandi M. The most critical barriers in conducting mammography screening among the Iranian women in arak in 2014. Health Education and Health Promotion. 2014 Mar 10;2(1):17-26.
12. Austin JD, Tehranifar P, Rodriguez CB, Brotzman L, Agovino M, Ziazadeh D, et al. A mixed-methods study of multi-level factors influencing mammography overuse among an older ethnically diverse screening population: implications for de-implementation. Implement Sci Commun. 2021 Dec;2:110. PMCID: PMC8474751 DOI: 10.1186/s43058-021-00217-7
13. Salama BM. Factors affecting mammography screening utilization among educated women in Al Beheira governorate, Egypt. Indian J Community Med 2020 Oct 1;45(4):522-5. PMCID: PMC7877424 DOI: 10.4103/ijcm.IJCM_41_20


 

14. Jang MK, Chung DW, Hamlish T, Rhee E, Mathew A, Li H, Doorenbos AZ. Factors influencing mammography uptake following a screening intervention among Asian American women: a systematic review. J Immigr Minor Health. 2021 Dec;23(6):1293-1304. DOI: 10.1007/s10903-021-01172-0

15. Alhindi BSM. Practice, Perception and Satisfaction Regarding Mammography among Saudi Females. Int J Pharm Res Allied Sci. 2022;11(1):113-20. https://doi.org/10.51847/KBUc8DsiTj

16. Icanervilia AV, van der Schans J, Cao Q, de Carvalho AC, Cordova-Pozo K, At Thobari J, et al. Economic evaluations of mammography to screen for breast cancer in low- and middle-income countries: A systematic review. J Glob Health. 2022 Jul 16:12:04048.https://doi.org/10.7189/jogh.12.04048.

17. Grimm LJ, Avery CS, Hendrick E, Baker JA. Benefits and risks of mammography screening in women ages 40 to 49 years. J Prim Care Community Health. 2022 Jan-Dec:13:21501327211058322. PMCID: PMC8796062
DOI: 10.1177/21501327211058322

18. Alhabes H, Alhabes F, Alqhtani A, Gahes S, Alshehri Z, Hawsawi K, et al. Awareness, Knowledge and Attitude of Saudi Women about Mammogram in Breast Cancer Screening: Systematic Review. Saudi J Med Pharm Sci 2022 9(11): 758-766. https://doi.org/10.36348/sjmps.2023.v09i11.004.

19. Abdel-Salam DM, Mohamed RA, Alyousef HY, Almasoud WA, Alanzi MB, Mubarak AZ, et al. Perceived Barriers and Awareness of Mammography Screening Among Saudi Women Attending Primary Health *Centers.* Risk Manag Healthc Policy. 2020;13:2553-2561. https://doi.org/10.2147/RMHP.S277375.

20. Abdel-Salam DM , Mohamed RA , Alyousef HY, Almasoud WA , Alanzi MB, Mubarak AZ, Osman DM. Perceived Barriers and Facilitators to Breast Cancer Screening Among Women in Saudi Arabia. *Breast Cancer (Dove Med Press)*. 2023;15:505-513
https://doi.org/10.2147/BCTT.S406029

21. Ro V, Jones T, Silverman T, McGuinness JE, Guzman A, Amenta J, et al. Patient, primary care provider, and stakeholder perspectives on mammography screening frequency: lessons learned from a qualitative study. BMC cancer. 2022 Jul 27;22(1):819.

22. Momenimovahed Z, Tiznobaik A, Taheri S, Hassanipour S, Salehiniya H. A review of barriers and facilitators to mammography in Asian women. Ecancermedicalscience. 2020;14.

23. Dirican O, Hülür Ü. The Mammography Screening Ratios and Factors Affecting to Get It Among Primary Care Health Providers. Turkish Journal of Family Medicine and Primary Care. 2020;14(2):216-23.

24. Luleci D, Kilic B. Factors affecting women's participation in breast cancer screening in Turkey. Asian Pac J Cancer Prev. 2022 May 1;23(5):1627-1634. PMCID: PMC9587867
DOI: 10.31557/APJCP.2022.23.5.1627

 