Knowledge, attitude, and practice regarding breast cancer and mammography screening among Iraqi women

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Abstract

Background: Breast cancer is the leading cause of cancer-related deaths among women worldwide. Early detection through screening methods such as mammography significantly reduces mortality rates. However, knowledge, attitudes, and practices regarding breast cancer screening vary widely, particularly in developing regions.

Aims of study : This study aims to assess the knowledge, attitudes, and practices of women in Baghdad regarding breast cancer and mammography screening. Additionally, it examines the association between knowledge and attitudes to identify gaps in targeted awareness campaigns.

Subjects and Methods: A cross-sectional study was conducted from March to November 2024 at Al-Kindy Teaching Hospital in Baghdad. A total of 384 women aged 20 years and older were recruited using a convenience sampling method. Data were collected through self-administered questionnaires covering demographic details, knowledge of breast cancer risk factors, awareness of signs and symptoms, and attitudes and practices regarding mammography. Descriptive statistics and chi-square tests were applied using SPSS-27 to analyze the data.

Results: The results shows that more than half of the participants (51.6%) demonstrated moderate knowledge about breast cancer risk factors and symptoms, while 38.5% exhibited good knowledge. However, awareness of modifiable risk factors such as obesity, alcohol consumption, and oral contraceptive use was notably low. Regarding attitudes, 54.2% of women believed that early detection prolongs life, yet 51.6% expressed neutral attitudes toward screening. Only 37.5% had undergone mammography, with adherence to regular screening remaining low. Significant associations were found between knowledge and age ($p = 0.031$), education ($p = 0.019$), personal ($p = 0.004$) and family history of breast cancer ($p < 0.001$). Practices were significantly associated with education ($p = 0.05$) and personal history ($p < 0.001$).

Conclusion: The study revealed a moderate level of breast cancer awareness among women in Baghdad, with notable gaps in knowledge about modifiable risk factors and screening practices. Public health efforts are needed to enhance awareness, promote regular screening, expand access to affordable services, and address psychological barriers to early detection.

Key-words: Breast cancer, mammography, screening, knowledge, attitudes, practices, Baghdad

Introduction

Breast cancer is the most commonly diagnosed cancer among women and the second leading cause of cancer-related deaths worldwide.[1] Its incidence increases with age, with most cases diagnosed between 55 and 64 years.[2] The American College of Radiology recommends that average-risk women begin screening at age 40.[3] While screening programs have been successful in detecting breast cancer early in developed countries, many women in developing regions remain undiagnosed until symptoms appear.[4] Breast cancer remains a major global health burden, accounting for 11.7% of all new cancer cases in 2020, according to the World Health Organization.[5]

In the United States, approximately one in eight women and one in a thousand men will develop breast cancer during their lifetime.[6,7]The incidence increases with age, peaking at 421.3 cases per 100,000 in women aged 75–79 years. Notably, 95% of new cases occur in women aged 40 and older, with a median diagnosis age of 61 years. In Iraq, breast cancer represents the most common malignancy among women, accounting for approximately one-third of all female cancer cases,with an increasing incidence over recent year particularly among women aged 40–49 years.[8]

While early detection and advanced treatments have led to a significant decline in breast cancer mortality in North America and parts of Europe, incidence and mortality rates continue to rise in several Asian and African countries.[9] Additionally, disparities persist within developed nations, where African American women experience higher mortality rates despite a lower overall incidence compared to non-Hispanic white women.[9]

Breast cancer screening aims to detect malignancies at an early, treatable stage, with mammography being the most widely used modality for both screening and diagnosis. [10] Due to its high sensitivity and specificity, mammography remains the primary tool for early breast cancer detection, significantly reducing mortality rates by approximately 30% in screened populations. [11,12] Its ability to identify architectural distortions and microcalcifications allows for early intervention before lesions become palpable.[13] However, mammography is not infallible, as nearly 28% of breast cancers may go undetected, particularly in women with dense breast tissue.[14]

Aims of the Study

1. To assess women's knowledge, attitude, and the current practice of mammography.
2. To study the association between the knowledge and attitudes among the participant women.

Subjects and Method:

This is a cross sectional study was carried out in AL-Kindy teaching hospital during a period from 1st of March to 31st November 2024 among Iraqi women from the general public attended to hospital.

Sampling Size:

Daniel and Cross, (2018) formula was used to calculate the sample size. [15] As a result, the minimum sample size for women is 384, as shown below:

$$n = \frac{Z^2 P(1-P)}{d^2}$$

n = sample size
Z = Z-score corresponding to the level of confidence (for a 95% confidence level, Z ≈ 1.96)
P=Expected prevalence or proportion (50%)
d = Precision (d= 0.05) (the maximum allowable difference between the sample proportion and the population proportion)

n (sample size) =3.8416*0.25/0.0025 = 384

Sampling Technique: a non-probability convenience sample of 384 women was selected from those who visited Al-Kindy Teaching Hospital.

Inclusion Criteria:

1. All women ages equal or above 20 years
2. Women who are residents of Baghdad city

Exclusion Criteria:

1. Women with psychological disorders whose health conditions may affect their responses or ability to participate in this study.

2. Individuals outside the target age group for the study

Ethical Considerations: Institutional approval for the study was obtained from the Committee of Al-Kindy teaching hospital. All participants were volunteers, exercising their autonomy to decide whether to participate. They were informed about the study's purpose and assured of the confidentiality of the collected data. No personal identification information was collected or stored, ensuring anonymity. Completing the questionnaire was considered an agreement to participate and consent to use their responses solely for research purposes.

Data Collection and Instruments: The study utilized a self-administered questionnaire in English, specifically designed for data collection. The questionnaire was divided into four sections:

1. Demographic Information – Collected data on the respondent's age, educational level, area of residence, employment status, marital status, and personal or family history of breast cancer.

2. Knowledge of Breast Cancer Risk Factors – Assessed participants' awareness of factors contributing to breast cancer development.

3. Knowledge of Breast Cancer Signs and Symptoms – Evaluated respondents' recognition of common signs and symptoms of the disease.

4. Knowledge, Attitude, and Practice toward Mammography – Investigated female respondents' understanding, perceptions, and behaviors regarding mammography screening.

• Knowledge-related questions were structured with response options: "Yes," "No," or "Don't know."

• Attitude-related questions were answered using a three-point scale: "Agree," "Neither agree nor disagree," and "Disagree."

Rating Scoring: Knowledge was assessed using a three-point Likert scale (Yes = 3, Don't know = 2, No = 1) across 16 items, with total scores ranging from 16 to 48. Scores <32 were considered poor, 32–40 moderate, and >40 good.Attitudes were evaluated through 7 items using a three-point Likert scale (Agree = 3, Neutral = 2, Disagree = 1) for positive statements, and reversed scoring for negative statements. Total scores ranged from 7 to 21, with <14 indicating negative attitudes, 14–18 neutral, and >18 positive attitudes.Practices were assessed using a two-point Likert scale

(Yes = 2, No = 1) for four positive items.Total scores ranged from 4 to 8; scores <6 indicated poor practices, while scores ≥6 indicated good practices. [16]

Statistical Analysis: The information for each item on the questionnaire was copied to code sheets, the data was input into a personal computer, and the statistical package from SPSS-27 was used to evaluate the data. Simple statistics like frequency, percents, average, standard deviation, and range displayed the data. A Chi-square test (X2 -test) was utilized to identify the significance of qualitative data percentage differences. The P-value was considered statistically significant when it was equal to or less than 0.05. [17]

Results:

Demographic characteristics of study group

In Table 1, the results of this study indicate that the highest percentage (42.2%) of women belonging to ages (40-49 years), followed by 32.8% (≥ 50 years).Regarding educational level, the results report that 40.6% of the women have primary level, followed by Bachelor's (35.4%).Regarding marital status, the present study found that most the participants were married (74.0%).The results reveal that 63.0% of the women live in urban areas. The study found that only 17.7% of the participants have history of breast cancer. While 40.6% of the women have family history of breast cancer.

Knowledge of women:

In figure 1, the results reveal that more than half (51.6%) of the women have a moderate knowledge score and 38.5% of the participants have a good knowledge score. While only 10.4% of the women have a poor knowledge score.

In Table 2, the current results found that the highest percentages (90.1%, 80.2%, 80.2%, 78.6% and 40.1%) of the women were aware about potential risk factors of breast cancer as family history, old age, genetics, personal history, and smoking respectively. While the highest percentages (33.9%, and 46.9%) of the participants were not aware about potential risk factors of breast cancer as overweight or obese, and oral contraceptive pills or HRT respectively. Also, the results report that 41.1% and 43.2% of the women reported with "Don't know" about drinking alcohol and early menarche or late menopause as potential risk factors of breast cancer respectively.

Table (1): The distribution of study group according to demographic characteristics

Demographic characteristics of women		No.	%
Age of woman (years)	20-29 years	42	10.9
	30-39 years	54	14.1
	40-49 years	162	42.2
	≥ 50 years	126	32.8
Education level of woman	Read and write	64	16.7
	Primary	156	40.6
	Bachelor's	136	35.4
	Postgraduate	28	7.3
Marital status	Single	44	11.5
	Married	284	74.0
	Divorced	36	9.4
	Widowed	20	5.2
Geographic area of residence	Rural	142	37.0
	Urban	242	63.0
History of breast cancer	Yes	68	17.7
	No	316	82.3
Family history of breast cancer	Yes	156	40.6
	No	228	59.4

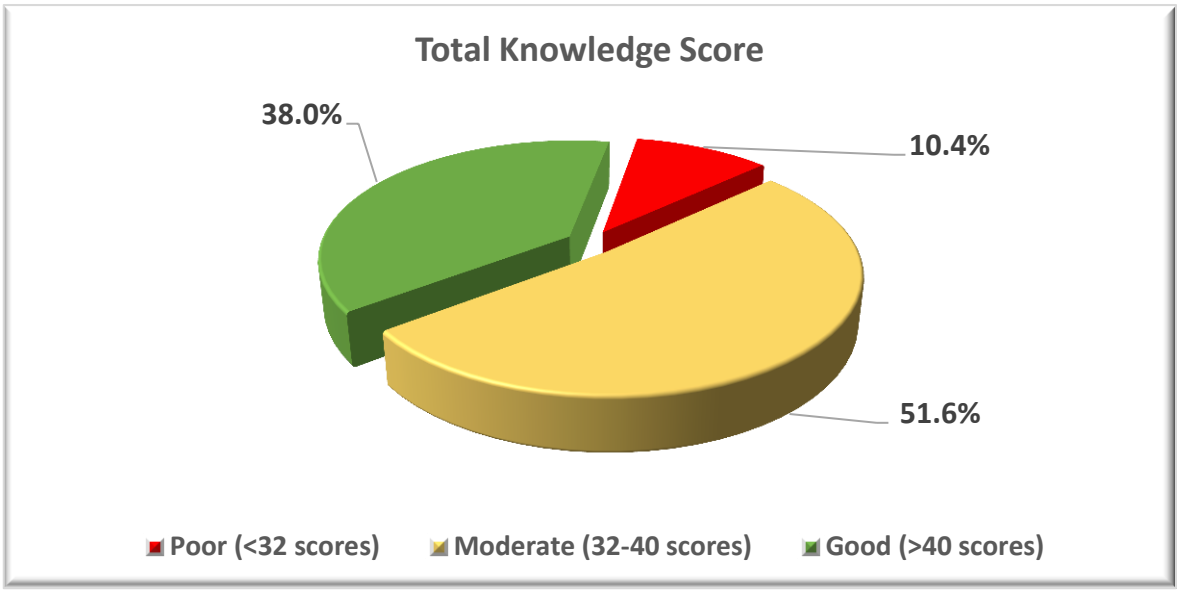

Figure (1): Pie chart illustrates the total knowledge score of the participants

Table (2): The distribution of women's responses according to their knowledge about risk factors associated with breast cancer

Potential risk factors	Yes		No		Don't know	
	No.	%	No.	%	No.	%
Old age	308	80.2	24	6.3	52	13.5
Genetics	308	80.2	24	6.3	52	13.5
Overweight or obese	130	33.9	130	33.9	124	32.3
Drinking alcohol	126	32.8	100	26.0	158	41.1
Smoking	154	40.1	92	24.0	138	35.9
Use Oral contraceptive pills or HRT	32	8.3	180	46.9	172	44.8
Early menarche or late menopause	58	15.1	160	41.7	166	43.2
Personal history	302	78.6	40	10.4	42	10.9
family history	346	90.1	24	6.3	14	3.6

Attitudes of women:

In figure 2, the results reveal that more than half (51.6%) of the women have neutral attitudes, and 26.6% of the participants have negative attitudes. While only 21.9% of the women have positive attitudes.

In Table 3, the current results found that the highest percentages (54.2%, and 62.5%) of the women were agree about "by early diagnosis of breast cancer, the person will have prolonged life", and "Breast cancer can be prevented" respectively. While the highest percentages (44.8%, 44.8%, 45.8%, 51.6%, and 64.6%) of the women reported with "Disagree" about "There is no reason for examine my breast", "If there is no problem in the breast, periodic breast examination by physician is not required", "Any woman at risk of breast cancer", "If I examine my breast myself, I can't detect any abnormalities in it", and "Early detection methods have no effect on treatment" respectively.

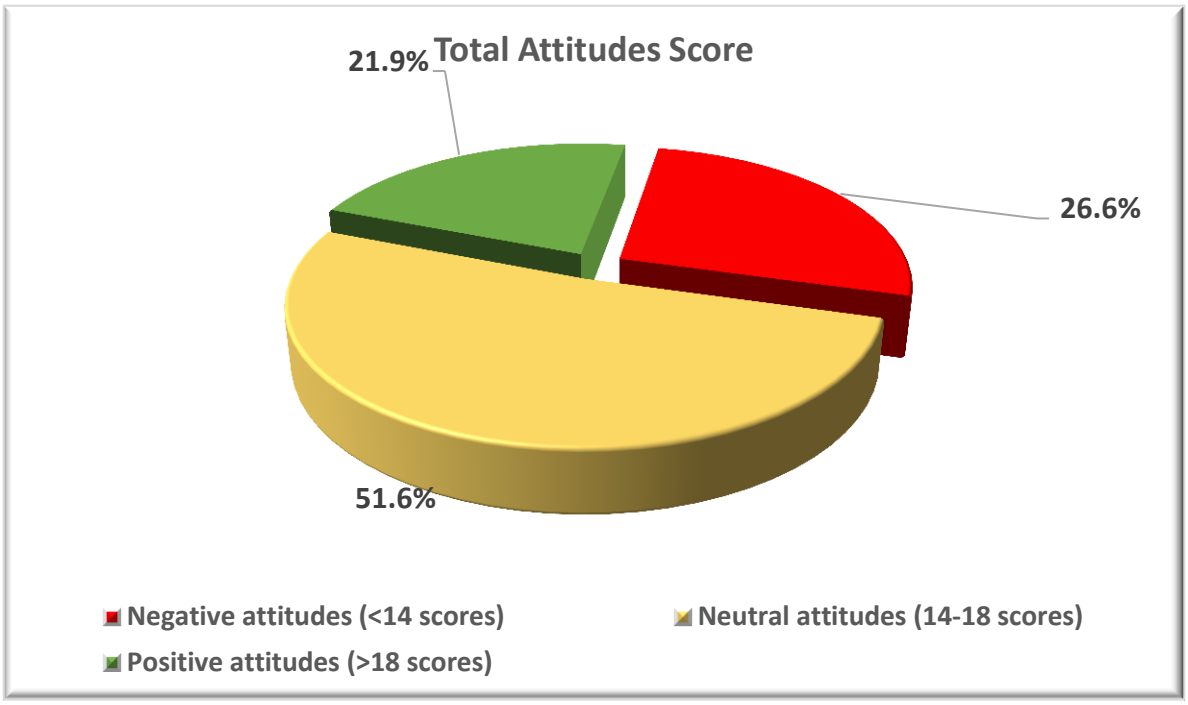

Figure (2): Pie chart illustrates the total attitudes score of the participants

Table (3): The distribution of women's responses regarding their attitudes about breast cancer and screening

Attitudes	Agree		Neither agree nor disagree		Disagree	
	No.	%	No.	%	No.	%
Any woman at risk of breast cancer	74	19.3	134	34.9	176	45.8
Breast cancer can be prevented	240	62.5	90	23.4	54	14.1
If I examine my breast myself, I can't detect any abnormalities in it	96	25.0	90	23.4	198	51.6
There is no reason for examine my breast	110	28.6	102	26.6	172	44.8
If there is no problem in the breast, periodic breast examination by physician is not required	154	40.1	58	15.1	172	44.8
Early detection methods have no effect on treatment	62	16.1	74	19.3	248	64.6
By early diagnosis of breast cancer, the person will have prolonged life	208	54.2	136	35.4	40	10.4

Practices of women regarding mammography screening

In figure 3, the results reveal that more than half (53.5%) of the women have good practice , and 46.5% of the participants have poor practice.

In Table 4, the results found that only 144 (37.5%) of the women had a mammogram before. According to the first question, out of 144 women, there was 85.4% of them started mammography at the age >40 years, and 51.4% of the women frequency of mammography done > 2 years. While only 24.3% of the participants reported that mammography done was a painful, and 11.1% of them reported that test help them for early detection of breast cancer.

Figure (3): Pie chart illustrates the total practice score of the participants

Table (4): The distribution of women's responses regarding their practices about mammography screening

Practices		No.	%
Have you had a mammogram before?	Yes	144	37.5
	No	240	62.5
At what age did you start mammography?	< 40 years	21	14.6
	>40 years	123	85.4
How many years have you had mammography done?	< 2 years	70	48.6
	>2 years	74	51.4
Is it painful?	Yes	35	24.3
	No	109	75.7
Is this test helpful for early detection of breast cancer?	Yes	16	11.1
	No	128	88.9

In table 5, represents the association between total knowledge score and total attitudes score. The results found that there was a direct significant association between total knowledge score and total attitudes score (r= 0.329; P. value <0.001).

Table (5): associations between total knowledge score and total attitudes score

Association		
		Total Attitudes Score
Total Knowledge Score	Pearson Association	0.329*
	P. value	<0.001
	N	384

*Association is significant at the 0.01 level (2-tailed).

Discussion:

The present study explored the knowledge, attitudes, and practices of Iraqi women in Baghdad regarding breast cancer and mammography screening. The results revealed that the largest proportion of participants were aged between 40–49 years (42.2%), followed by those aged ≥50 years (32.8%). This is consistent with global and regional trends, as women in these age groups are often the primary target for breast cancer awareness and screening campaigns due to the increased incidence in this age range[18].Similar findings were reported in Saudi Arabia, where the majority of participants in awareness programs were aged 40–49 years (38%)[18], and in Jordan, where 45% of women fell within the same age bracke. [19]

In terms of educational attainment, 40.6% of participants had completed only primary education, and only 7.3% held a postgraduate degree. This indicates a relatively low representation of women with higher education, contrasting with studies in Turkey, where approximately 50% of participants had at least a bachelor's degree.[20] These differences may be attributed to socioeconomic disparities, cultural norms, and infrastructural challenges in Iraq, especially in rural areas where access to education remains limited.[21] Marital status was another important demographic factor, with 74.0% of women being married. This aligns with findings from Egypt, where 80% of participants were married. [22] Married women often assume caregiving roles within families, which may

increase their exposure to healthcare services and related awareness campaigns.

Similarly, urban residency was more common (63%) than rural (37%), likely due to better access to healthcare facilities and information in cities. This urban-rural divide in awareness and screening participation has also been observed in Saudi Arabia and Egypt. [23]

Only 17.7% of participants reported a personal history of breast cancer, while 40.6% had a family history, indicating the influence of genetic and familial factors in shaping women's perceptions of risk. These findings are similar to those reported in Jordan and Turkey, where around 40% of women acknowledged a family history of the disease.[24] Knowledge regarding family history as a risk factor was high (90.1%), but awareness of modifiable and lifestyle-related risk factors was limited. For example, only 33.9% recognized obesity as a risk factor, and 41.1% were unaware or unsure about the role of alcohol consumption. Awareness about oral contraceptive use was particularly low (only 8.3% identified it as a risk). [25]

The study also assessed participants' knowledge about the signs and symptoms of breast cancer. While 93.8% recognized the presence of a breast lump as a symptom, fewer women were aware of more subtle or less visible signs, such as nipple retraction (39.6%) or skin dimpling. These findings are in line with studies from Saudi Arabia, Egypt, and Turkey, which have also reported high recognition of lumps but lower awareness of other warning signs. [26] This suggests a need to broaden the scope of public health campaigns to include education on all potential signs of breast cancer.

With regard to attitudes, 54.2% of women believed that early detection prolongs life, and 62.5% agreed that breast cancer can be prevented. However, 51.6% expressed neutral attitudes toward personal breast self-examination, and a significant portion (44.8%) disagreed with the need for periodic clinical breast exams in the absence of symptoms. These findings mirror regional patterns where overall attitudes are moderately positive, yet misconceptions and uncertainty about screening persist. [27]

In terms of practice, only 37.5% of participants had ever undergone mammography screening, and among those, 51.4% had their last screening more than two years ago. Most women (85.4%) began mammography after age 40, in accordance with global recommendations. However, regular and timely screenings were uncommon, suggesting gaps in awareness or accessibility. Only 11.1% of women believed the test had helped in early detection, and 24.3% reported the procedure as painful, which may also contribute to low uptake. Similar patterns have been documented in Saudi Arabia, Egypt, and Turkey, where mammography use remains limited, irregular, and often symptom-driven. [28]

This study has some limitations:

1. Lack of an Internationally Standardized Questionnaire – There was no universally accepted questionnaire available to assess breast cancer knowledge, so we developed our own based on information from previous studies. This may limit the comparability of our results with those from other studies.
2. Small Sample Size – The sample size was relatively small, which may reduce the ability to generalize the findings.
3. Disproportionate Representation – The number of urban women surveyed was higher compared to rural women, which could impact the representativeness of the sample.
4. Cultural Sensitivity and Participation – Many women declined to participate due to the social stigma surrounding breast cancer. Some were afraid to even mention the disease by name, referring to it as "that other disease," fearing that discussing it could increase their risk of developing it.

Conclusions

This study revealed moderate knowledge about breast cancer among women in Baghdad, but awareness of modifiable risk factors was limited. Attitudes toward screening were mostly neutral, and mammography utilization remained low and irregular. These findings underscore the importance of enhancing public education, especially in rural and underserved areas, and providing free or subsidized screening to increase participation. Targeted awareness campaigns should focus on lifestyle-related risk factors and promote early detection. Collaborative efforts with healthcare providers and community leaders are essential to improve screening behaviors. Future studies should include diverse populations and consider alternative approaches to breast cancer screening.

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