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FACTORS ASSOCIATED WITH DELAYED PRESENTATION OF BREAST CANCER AMONG WOMEN ATTENDING BREAST CLINICS

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ABSTRACT

Background: Breast cancer is the most common malignancy among women worldwide and represents a major public health concern due to its increasing incidence and associated mortality. Early detection services play a crucial role in reducing breast cancer-related morbidity and mortality through timely diagnosis and treatment. Evaluation of the quality of breast cancer early detection services is essential for identifying strengths and areas requiring improvement. **Objectives:** To assess the quality of breast cancer early detection services provided at the Breast Early Detection Unit of Al-Khansaa Teaching Hospital in Mosul, Iraq. **Methods:** A hospital-based cross-sectional audit study was conducted at the Breast Early Detection Unit of Al-Khansaa Teaching Hospital, Mosul, Iraq, from March 2025 to April 2026. The study included 330 women attending the unit for breast cancer screening, diagnostic evaluation, or follow-up services. Data were collected using a structured questionnaire and review of clinical records. Information regarding sociodemographic characteristics, referral pathways, breast self-examination practices, mammography history, diagnostic services, waiting time, final diagnosis, and patient satisfaction was obtained and analyzed using the Statistical Package for Social Sciences version 31. **Results:** Women aged 40–49 years constituted the largest age group (28.8%), and most participants were married (78.2%) and urban residents (74.2%). Breast lump was the most common reason for attendance (40.9%), followed by breast pain (25.8%). Self-referral represented the main source of attendance (45.5%), while Primary Health Care Centers accounted for 28.8% of referrals. Regular breast self-examination was reported by 27.3% of women, whereas 58.2% had never undergone mammography. Clinical breast examination was performed for all participants, breast ultrasonography for 84.8%, and mammography for 65.2%. Most women received imaging services on the same day (57.6%) or within one week (28.8%). Fibroadenoma (27.9%) and fibrocystic breast changes (25.5%) were the most common diagnoses, while breast cancer was identified in 11.5% of participants. Overall, 77.2% of women were satisfied or very satisfied with the services provided, and 74.2% rated the quality of services as good or excellent. **Conclusions:** The Breast Early Detection Unit at Al-Khansaa Teaching Hospital provides accessible and comprehensive breast cancer early detection services with high levels of patient satisfaction and efficient diagnostic service delivery. However, the low rates of regular breast self-examination, previous mammography utilization, and routine screening attendance indicate the need for enhanced public awareness, improved screening uptake, and stronger collaboration between primary healthcare facilities and specialized breast services to promote earlier detection of breast cancer.

KEYWORDS: Breast cancer, Early detection, Mammography, Quality audit, Screening services, Patient satisfaction.

1-INTRODUCTION

Breast cancer is the most frequently diagnosed cancer among women worldwide and remains a leading cause of cancer-related mortality. It represents a major public health challenge because of its increasing incidence and substantial impact on patients, families, and healthcare

systems. According to the World Health Organization, breast cancer accounts for approximately one quarter of all female cancers globally and is responsible for a considerable proportion of cancer deaths among women.[1]

Early detection is one of the most effective strategies for reducing breast cancer mortality. When diagnosed at an early stage, breast cancer is associated with improved treatment outcomes, higher survival rates, better quality of life, and lower healthcare costs. Conversely, delayed diagnosis often results in advanced-stage disease requiring more extensive treatment and is associated with poorer prognosis.[2-3]

Breast cancer early detection services include health education, breast self-examination awareness, clinical breast examination, mammographic screening, diagnostic imaging, pathological confirmation, referral pathways, and follow-up services. The effectiveness of these services depends on accessibility, availability of trained healthcare providers, adequate equipment, and adherence to quality standards.[4-5]

In low- and middle-income countries, several barriers hinder the successful implementation of breast cancer screening programs. These barriers include limited awareness, socioeconomic challenges, cultural beliefs, inadequate healthcare infrastructure, and restricted access to mammography facilities. Consequently, many women continue to present with advanced disease, reducing the likelihood of successful treatment outcomes.[6]

Breast cancer is the most common cancer among Iraqi women and constitutes a significant healthcare burden. National cancer registry reports have demonstrated a continuous increase in breast cancer incidence over recent decades. Despite the establishment of breast cancer screening and early detection centers, many Iraqi women are still diagnosed at advanced stages of the disease.[7-8]

Healthcare quality assessment has become an essential component of modern medical practice. Quality audits are systematic evaluations designed to assess healthcare services against predetermined standards and identify areas requiring improvement. In breast cancer care, audits provide valuable information regarding service accessibility, screening coverage, diagnostic capacity, referral efficiency, waiting times, and patient outcomes.[9-10]

Al-Khansaa Teaching Hospital in Mosul is a major referral center for women's health and breast disease services in Nineveh Governorate. The hospital provides breast cancer screening, diagnostic, and referral services to women from Mosul and surrounding areas. Therefore, evaluating the quality of breast cancer early detection services at this institution is important for identifying areas that require improvement and enhancing service effectiveness. Given the increasing burden of breast cancer and the importance of early diagnosis, this study aims to assess the quality of breast cancer early detection services at Al-Khansaa Teaching Hospital and contribute to improving women's health outcomes in Nineveh Governorate.

2-PATIENTS AND METHODS

Ethical approval was obtained from Nineveh Directorate of Health ethical committee before data collection. Verbal or written informed consent was obtained from all participants before inclusion in the study. Patient confidentiality was maintained throughout the study by using anonymous data collection forms, and all collected information was used only for scientific research purposes. This hospital-based cross-sectional audit study was conducted at the Breast Early Detection Unit of Al-Khansaa Teaching Hospital in Mosul, Nineveh Governorate, Iraq. Al-Khansaa Teaching Hospital is one of the main referral centers for women's health services and breast disease diagnosis in the governorate, serving patients from Mosul city and surrounding districts. The study was carried out over a period of 14 months from March 2025 to April 2026.

The study population consisted of women attending the Breast Early Detection Unit for breast cancer screening, diagnostic evaluation, or follow-up services during the study period. A total of 330 women were enrolled in the study using a convenient sampling method. Women aged 18 years and above who attended the unit and agreed to participate were included in the study. Women with incomplete records, those who declined participation, or those unable to complete the interview were excluded.

Data were collected through direct interviews using a structured questionnaire designed for the purpose of the study, in addition to reviewing relevant clinical and radiological records. Information collected included socio-demographic characteristics, referral source, reason for attendance, breast cancer screening history, clinical breast examination findings, imaging investigations performed, waiting time for services, and patient satisfaction with the quality of care provided. Data regarding mammography, breast ultrasonography, and final diagnostic outcomes were also recorded when available.

The quality of breast cancer early detection services was assessed through selected audit indicators, including accessibility of services, utilization of screening methods, referral pathways, availability of diagnostic investigations, timeliness of service delivery, and patient satisfaction. These indicators were chosen to provide a comprehensive evaluation of the performance of the Breast Early Detection Unit and to identify potential areas for improvement.

Data were entered and analyzed using the Statistical Package for Social Sciences (SPSS) version 31. Descriptive statistics were expressed as frequencies, percentages, means, and standard deviations as appropriate. Associations between categorical variables were examined using the Chi-square test, and a P value of less than 0.05 was considered statistically significant.

3-RESULTS

The study included 330 women attending the Breast Early Detection Unit. Women aged 40–49 years constituted the largest age group. Most participants were married and resided in urban areas, indicating that middle-aged married women represented the predominant users of breast early detection services during the study period. Table 3.1 shows that women aged 40–49 years constituted the largest age group, accounting for 95 (28.8%) participants, followed by those aged 30–39 years who represented 88 (26.7%) women. Women aged less than 30 years and those aged 50 years or older accounted for 72 (21.8%) and 75 (22.7%), respectively. Regarding marital status, the majority of participants were married, representing 258 (78.2%) women, while single and widowed/divorced women accounted for 35 (10.6%) and 37 (11.2%), respectively. In relation to residence, most participants lived in urban areas, accounting for 245 (74.2%), whereas 85 (25.8%) were from rural areas.

Table 3.1: Sociodemographic characteristics of women attending the breast early detection unit (number = 330).

Variable	Number	Percentage
Age <30 years	72	21.8%
Age 30–39 years	88	26.7%
Age 40–49 years	95	28.8%
Age ≥50 years	75	22.7%
Married	258	78.2%
Single	35	10.6%
Widowed/Divorced	37	11.2%
Urban residence	245	74.2%
Rural residence	85	25.8%

Table 3.2 demonstrates that breast lump was the most common reason for attendance, reported by 135 (40.9%) women. Breast pain was the second most common complaint, affecting 85 (25.8%) participants. Routine screening accounted for 60 (18.2%) visits, while nipple discharge was reported by 28 (8.5%) women. A family history of breast cancer was the reason for attendance among 12 (3.6%) participants, whereas other complaints accounted for 10 (3.0%) cases.

Table 3.2: Main reason for attendance (number = 330).

Reason	Number	Percentage
Breast lump	135	40.9%
Breast pain	85	25.8%
Routine screening	60	18.2%
Nipple discharge	28	8.5%
Family history	12	3.6%
Other	10	3.0%

Table 3.3 shows that self-referral was the most common source of attendance, accounting for 150 (45.5%) women. Primary Health Care Centers referred 95 (28.8%) participants and represented the most important formal referral source. Obstetrics and Gynecology Clinics contributed 42 (12.7%) referrals, while General Surgery Clinics referred 25 (7.6%) women. Internal Medicine Clinics and the Oncology Center accounted for 10 (3.0%) and 8 (2.4%) referrals, respectively.

Table 3.3: Source of referral (number = 330).

Source	Number	Percentage
Self-referral	150	45.5%
PHCCs	95	28.8%
Obstetrics & Gynecology	42	12.7%
General Surgery	25	7.6%
Internal Medicine	10	3.0%
Oncology Center	8	2.4%

Table 3.4 demonstrates that 90 (27.3%) women reported performing breast self-examination regularly, while 120 (36.4%) performed it irregularly. Another 120 (36.4%) participants had never practiced breast self-examination. These findings indicate that only about one-quarter of women regularly performed breast self-examination, whereas nearly three-quarters either practiced it inconsistently or not at all.

Table 3.4: Practice of breast self-examination (number = 330).

Practice	Number	Percentage
Regularly	90	27.3%
Irregularly	120	36.4%
Never	120	36.4%

Table 3.5 shows that 138 (41.8%) women had previously undergone mammography, whereas 192 (58.2%) had never undergone mammographic examination before attending the Breast Early Detection Unit. The findings indicate that more than half of the participants had not utilized mammography services despite their importance in the early detection of breast cancer.

Table 3.5: Previous mammography history (number = 330).

History	Number	Percentage
Yes	138	41.8%
No	192	58.2%

Table 3.6 demonstrates that clinical breast examination was performed for all 330 (100.0%) women attending the unit. Breast ultrasonography was performed for 280 (84.8%) participants, while mammography was conducted for 215 (65.2%) women. Fine needle aspiration cytology was required in 38 (11.5%) cases and core needle biopsy in 14 (4.2%) cases.

Table 3.6. Diagnostic services provided (number = 330).

Service	Number	Percentage
Clinical breast examination	330	100.0%
Breast ultrasonography	280	84.8%
Mammography	215	65.2%
FNAC	38	11.5%
Core needle biopsy	14	4.2%

Table 3.7 shows that 190 (57.6%) women received diagnostic imaging on the same day of attendance, while 95 (28.8%) underwent imaging within one to seven days. Only 45 (13.6%) women experienced waiting periods exceeding seven days.

Table 3.7: Waiting time for diagnostic imaging (number = 330).

Waiting Time	Number	Percentage
Same day	190	57.6%
1–7 days	95	28.8%
More than 7 days	45	13.6%

Table 3.8 demonstrates that BI-RADS 2 was the most common mammographic category, observed in 92 (42.8%) women, followed by BI-RADS 1 in 48 (22.3%) cases. BI-RADS 3 findings were reported in 38 (17.7%) women, while suspicious findings categorized as BI-RADS 4 and BI-RADS 5 were identified in 25 (11.6%) and 12 (5.6%) women, respectively.

Table 3.8: Mammographic findings (number = 330).

Finding	Number	Percentage
BI-RADS 1	48	22.3%
BI-RADS 2	92	42.8%
BI-RADS 3	38	17.7%
BI-RADS 4	25	11.6%
BI-RADS 5	12	5.6%

Table 3.9 shows that benign lesions were the most common ultrasonographic finding, detected in 165 (58.9%) women. Normal findings were observed in 52 (18.6%) participants, while suspicious and highly suspicious lesions were identified in 45 (16.1%) and 18 (6.4%) women, respectively.

Table 3.9: Breast ultrasonography findings (number = 330).

Finding	Number	Percentage
Normal	52	18.6%
Benign lesion	165	58.9%
Suspicious lesion	45	16.1%
Highly suspicious	18	6.4%

Table 3.10 demonstrates that fibroadenoma was the most common final diagnosis, affecting 92 (27.9%) women, followed by fibrocystic breast changes in 84 (25.5%) cases. Normal findings were reported in 60 (18.2%) participants, while breast cysts and mastitis/breast abscess accounted for 32 (9.7%) and 24 (7.3%) cases, respectively. Breast cancer was diagnosed in 38 (11.5%) women.

Table 3.10: Final diagnosis (number = 330).

Diagnosis	Number	Percentage
Fibroadenoma	92	27.9%
Fibrocystic changes	84	25.5%
Breast cyst	32	9.7%
Mastitis/Abscess	24	7.3%
Normal	60	18.2%
Breast cancer	38	11.5%

Table 3.11 shows that 145 (43.9%) women were satisfied and 110 (33.3%) were very satisfied with the services provided. Neutral opinions were reported by 48 (14.5%) participants, while 22 (6.7%) were dissatisfied and 5 (1.5%) were very dissatisfied. Overall, 255 (77.2%) women expressed satisfaction or high satisfaction with the services received.

Table 3.11: Patient satisfaction (number = 330).

Level	Number	Percentage
Very satisfied	110	33.3%
Satisfied	145	43.9%
Neutral	48	14.5%
Dissatisfied	22	6.7%
Very dissatisfied	5	1.5%

Table 3.12 demonstrates that 180 (54.5%) participants rated the quality of services as good, while 65 (19.7%) considered the services excellent. Another 65 (19.7%) women rated the services as fair, whereas only 20 (6.1%) assessed the quality as poor.

Table 3.12: Overall assessment of service quality (number = 330).

Assessment	Number	Percentage
Excellent	65	19.7%
Good	180	54.5%
Fair	65	19.7%
Poor	20	6.1%

Table 3.13 shows that fibroadenoma was the most common histopathological diagnosis, accounting for 18 (34.6%) cases, followed by invasive ductal carcinoma in

16 (30.8%) women. Fibrocystic breast changes were identified in 10 (19.2%) cases, while ductal carcinoma in situ was diagnosed in 4 (7.7%) women. Invasive lobular carcinoma and other benign lesions each accounted for 2 (3.8%) cases.

Table 3.13: Histopathological results among biopsied cases (number = 330).

Diagnosis	Number	Percentage
Fibroadenoma	18	34.6%
Fibrocystic changes	10	19.2%
DCIS	4	7.7%
Invasive ductal carcinoma	16	30.8%
Invasive lobular carcinoma	2	3.8%
Other benign lesions	2	3.8%

Table 3.14 demonstrates that 175 (53.0%) women were reassured and discharged following evaluation, while 82 (24.8%) were scheduled for follow-up visits. Referral for biopsy was required in 35 (10.6%) cases, whereas 24 (7.3%) women were referred to oncology services and 14 (4.2%) were referred for surgical management.

Table 3.14: Overall outcome of attendance (number = 330).

Outcome	Number	Percentage
Reassured and discharged	175	53.0%
Scheduled follow-up	82	24.8%
Referred for biopsy	35	10.6%
Referred to oncology	24	7.3%
Referred for surgery	14	4.2%

4- DISCUSSION

Breast cancer remains the most common cancer among women worldwide and represents a major public health challenge because of its increasing incidence and associated mortality. Early detection services play a crucial role in reducing disease burden through timely diagnosis and treatment, thereby improving survival outcomes and quality of life.[1–5]

The findings of the present study showed that women aged 40–49 years constituted the largest proportion of attendees (28.8%). This finding is consistent with current recommendations that emphasize the importance of breast cancer screening among middle-aged women because the incidence of breast cancer increases substantially after the age of 40 years.[3,5] Furthermore, the predominance of married women (78.2%) reflects the age distribution of the study population and is comparable to findings reported in regional breast cancer screening studies where married women constitute the majority of service users. The predominance of urban residents (74.2%) may indicate better accessibility to specialized healthcare facilities among urban populations compared with rural communities, where geographical and socioeconomic barriers may limit healthcare utilization.[6]

Breast lump was the most common reason for attendance, accounting for 40.9% of cases, followed by breast pain (25.8%). This finding suggests that symptomatic presentation remains the primary driver of attendance rather than participation in routine screening programs. Similar observations have been reported in many low- and middle-income countries where women frequently seek medical attention only after the development of symptom.[6] Although breast cancer screening programs aim to detect disease before symptom onset, the relatively low proportion of routine screening visits observed in the current study indicates the need for strengthening public awareness regarding the benefits of early detection.[1,10]

The referral pattern observed in this study demonstrated that self-referral represented the largest source of attendance (45.5%), while Primary Health Care Centers accounted for 28.8% of referrals. This finding highlights the critical role of primary healthcare services in the identification and referral of women with breast complaints. According to international breast cancer control frameworks, primary healthcare providers are essential components of successful breast cancer early detection programs because they facilitate health education, risk assessment, clinical examination, and timely referral to specialized services.[1-2] Nevertheless, the high proportion of self-referrals suggests opportunities to further strengthen structured referral pathways and improve coordination between primary care facilities and specialized breast clinics.

The study also revealed limited utilization of breast self-examination and mammography. Only 27.3% of women reported regular breast self-examination, while 58.2% had never undergone mammography before attending the Breast Early Detection Unit. Similar findings have been reported in several developing countries where awareness regarding breast cancer screening remains suboptimal.[6] Although breast self-examination is no longer recommended as a stand-alone screening tool, it remains important for promoting breast awareness and encouraging women to seek medical attention when abnormalities are detected.[3] The low utilization of mammography identified in the present study may reflect insufficient awareness, fear of diagnosis, financial limitations, or restricted access to screening services. Expanding mammography coverage remains a priority because mammographic screening has been shown to contribute significantly to early breast cancer detection and improved outcomes.[3-5]

Evaluation of diagnostic service provision demonstrated that all participants underwent clinical breast examination, while breast ultrasonography and mammography were performed in 84.8% and 65.2% of women, respectively. These findings indicate that the Breast Early Detection Unit provides a comprehensive diagnostic approach consistent with international recommendations for breast cancer assessment.[2,4] The

availability of imaging services and tissue diagnostic procedures such as fine needle aspiration cytology and core needle biopsy supports accurate diagnosis and appropriate patient management. According to European quality standards, multidisciplinary diagnostic evaluation is a fundamental requirement for high-quality breast cancer services.[4]

An important indicator of service quality is waiting time for diagnostic investigations. In the present study, 57.6% of women received imaging services on the same day and a further 28.8% underwent imaging within one week. These findings reflect relatively good accessibility and efficiency of service delivery. Timely access to diagnostic investigations is essential because delays may increase patient anxiety and postpone treatment initiation.[4,9] The relatively short waiting times observed in this study may therefore be considered a positive indicator of healthcare performance within the Breast Early Detection Unit.

The mammographic and ultrasonographic findings demonstrated that the majority of detected abnormalities were benign. Most mammograms were categorized as BI-RADS 1 or BI-RADS 2, while benign lesions represented the most common ultrasonographic finding. Similarly, fibroadenoma and fibrocystic breast changes accounted for the majority of final diagnoses. These findings are consistent with the epidemiological pattern of breast clinic attendance, where benign breast diseases are substantially more common than malignant conditions. Nevertheless, breast cancer was diagnosed in 11.5% of women, emphasizing the clinical value of breast early detection services in identifying malignant disease at a potentially treatable stage.

The proportion of breast cancer cases identified in the present study should be interpreted in the context of the increasing burden of breast cancer in Iraq. National cancer registry data indicate that breast cancer remains the most frequently diagnosed malignancy among Iraqi women and that incidence rates have continued to increase over recent years.[7-8] The detection of malignant lesions among more than one-tenth of attendees demonstrates the importance of maintaining and expanding breast cancer early detection services as part of national cancer control strategies.

Patient satisfaction is widely recognized as an important indicator of healthcare quality. In the current study, 77.2% of women reported being satisfied or very satisfied with the services provided, while only a small proportion expressed dissatisfaction. Furthermore, 74.2% rated the quality of services as good or excellent. These findings suggest a generally positive perception of the Breast Early Detection Unit among service users. Similar studies have demonstrated that patient satisfaction is strongly influenced by accessibility, waiting time, communication with healthcare providers, and perceived quality of care.[9] The favorable satisfaction levels observed in the present study may therefore reflect the effectiveness of service organization and delivery within the unit.

The present study has several limitations. It was conducted in a single tertiary healthcare center, which may limit the generalizability of the findings to other healthcare settings in Iraq. The cross-sectional design provided information at a specific point in time and did not allow assessment of long-term outcomes or changes in service quality. Some data were based on participants' self-reports, making them susceptible to recall bias, particularly regarding previous mammography history and breast self-examination practices. In addition, patient satisfaction was assessed subjectively and may have been influenced by individual expectations and experiences. Despite these limitations, the study provides valuable insights into the quality, accessibility, utilization, and patient perception of breast cancer early detection services at Al-Khansaa Teaching Hospital.

5- CONCLUSION AND RECOMMENDATION

The present study demonstrated that the Breast Early Detection Unit at Al-Khansaa Teaching Hospital provides accessible and comprehensive breast cancer early detection services with generally high levels of patient satisfaction and efficient diagnostic service delivery. Most women attended because of breast-related symptoms rather than routine screening, while the rates of regular breast self-examination and previous mammography utilization remained relatively low. Although the majority of diagnosed conditions were benign, breast cancer was identified in a considerable proportion of attendees, highlighting the importance of maintaining effective early detection services. Therefore, strengthening breast cancer awareness programs, promoting routine screening and mammography utilization, enhancing health education activities through Primary Health Care Centers, improving coordination between primary and specialized healthcare services, and expanding community-based early detection initiatives are recommended to facilitate earlier diagnosis and improve breast cancer outcomes among women in Nineveh Governorate.

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