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Original Research Article

Exploring barriers to mammography screening among women aged 40 to 74 attending Georgetown Public Hospital Corporation outpatient department: a knowledge, attitude and practice study

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ABSTRACT

Background: Breast cancer is the second leading cause of cancer-related deaths in Guyana, with rising cases despite free screening availability. This study examined the knowledge, attitudes, and practices of women aged 40 to 74 regarding mammography screening to identify barriers and enhance the uptake of mammography screening among Guyanese women.
Methods: A cross-sectional descriptive study was conducted at Georgetown Public Hospital Corporation outpatient department from October 1st to October 29th, 2025. Data were collected through a structured electronic questionnaire and analyzed using descriptive statistics, chi-square tests, and Pearson's correlation.
Results: Among 384 women, the overall awareness of breast cancer and mammography was high (73.4% and 63.4%, respectively), but the attitudes of the participants were negative (64.6%), and screening practices were poor (9.4%). The knowledge of mammography was significantly associated with age, ethnicity, education, region, and family history of breast cancer. The reasons for not having a mammogram includes lack of time (8.3%), fear of finding something (7.3%), cultural or religious beliefs (7.0%), cost (6.1%), worried about pain (26.7%), fear of diagnosis (23.6%), embarrassment (21.3%), and no expected benefits (11.3%).
Conclusions: In Guyana, although many women are aware of breast cancer and mammography, the screening uptake remains low. To improve participation, interventions must move beyond education and focus on emotional support, service accessibility, and culturally appropriate outreach.

Keywords: Breast cancer, Guyanese women, Knowledge, attitude, and practices, Mammography screening, Screening barriers

INTRODUCTION

Breast cancer is the most commonly diagnosed cancer among women worldwide and remains a leading cause of cancer-related mortality. In 2020, approximately 2.3 million new cases were diagnosed globally, accounting for 11.7% of all cancers, with an estimated 685,000 deaths reported. Early detection through screening programs has been shown to improve treatment outcomes and reduce breast cancer mortality.[1]

In Guyana, breast cancer accounts for a mortality rate of 10.9%, the second leading cause of cancer-related deaths among women. Between 2020 and 2024, the number of cases ranged from 123 to 253, while the annual breast cancer-related deaths from 2020 to 2023 ranged from 50 to 64, demonstrating persistent challenges.[2,3] To facilitate early detection, free mammography services are available through the Ministry of Health, Georgetown Public Hospital Corporation, Guyana Cancer Society, and other stakeholders.[4] However, many women continue to present

with advanced-stage disease, limiting treatment options and adversely affecting survival outcomes. Mammography remains the gold standard screening modality for the early detection of breast cancer and has been associated with reduced mortality through the identification of lesions before the onset of clinical symptoms. Despite its proven effectiveness, participation in mammography screening programs remains suboptimal in many countries, including those where screening services are provided free of charge.[5,6]

Studies conducted in various regions have identified numerous factors that influence mammography uptake. These include inadequate knowledge regarding breast cancer and screening recommendations, fear of diagnosis, misconceptions about the procedure, concerns about pain, cultural and religious beliefs, embarrassment, limited accessibility, and negative attitudes toward screening.[5-7] Such barriers often prevent women from utilizing available services even when they are aware of their existence. Although several studies have examined breast cancer screening practices internationally, there remains limited evidence regarding the knowledge, attitudes, practices, and barriers associated with mammography screening among women in Guyana. Understanding these factors is essential for designing targeted interventions that improve screening participation and promote early detection.

Therefore, this study aimed to assess the knowledge, attitudes, and practices regarding mammography screening among women aged 40-74 years attending the Georgetown Public Hospital Corporation Outpatient Department and to identify barriers influencing mammography screening uptake.

METHODS

Study design, setting, and period

This research employed a descriptive, cross-sectional design, conducted at the medical and surgical outpatient department of the Georgetown Public Hospital Corporation (GPHC) from October 1st 2025, to October 29th 2025.

Sample size and technique

According to the World Health Organization (2022), 126,750 females aged 40 to 74 live in Guyana. Based on this, the sample size was 384, which yielded a 95% confidence interval. A simple random sampling was done.

Selection criteria

This study included women aged 40 to 74 (patients and accompanying relatives/visitors) with no personal history of breast cancer, eligible to participate and willing to provide informed consent, speak English, and who are citizens of Guyana.

Procedure

Data were collected using a digital questionnaire administered through Google Forms. The instrument consisted of thirty (30) questions divided into four (4) sections and required approximately 10-15 minutes to complete. Before formal data collection, the questionnaire was pretested on ten (10) participants to evaluate clarity, relevance, and ease of use. Feedback from the pilot study informed minor adjustments to improve the tool's validity and functionality. Data collection was then conducted across designated areas. Participants were randomly selected, and their responses were automatically recorded in Google Forms and transferred to a structured data sheet for analysis. Responses to the knowledge, attitude, and practice items were categorized using a predefined scoring system. For the level of knowledge, scores ranging from 4 to 6 were classified as good, while scores of 1 to 3 were considered poor. Attitudes were categorized as positive with scores of 2 or more, and negative with scores of 1 or less. Screening practices were labeled good for scores of 2 or more, and poor for scores of 1 or less.

Statistical analysis

The data was cleaned and analysed using Excel and PSPP. Descriptive statistics, including frequencies, crosstabs, and chi-square tests, were used. Bivariate correlation was used to assess the correlation between knowledge, attitude towards, and practice of mammography with demographic variables such as age, ethnicity, region of residence, level of education, and family history of breast cancer.

Ethical approval

The researchers sought ethical clearance from the Georgetown Public Hospital Corporation Research Committee, the Ministry of Health's Institutional Review Board (IRB), and the director of medical and professional services to conduct the research at the facility. To ensure the protection of participants' rights and uphold ethical standards, the study adhered to the following principles:

Autonomy: participation in the study was entirely voluntary. Participants were informed that they could decline to participate or withdraw from the survey at any time without any consequences.

Confidentiality: all patient-identifying information was excluded to maintain privacy and protect vulnerable individuals.

Informed consent: informed consent was obtained through a cover letter that outlined the study's objectives, procedures, and the names of the investigators.

Data security completed questionnaires were stored as encrypted digital files and backed up on a secure, access-restricted drive to prevent unauthorized access.

RESULTS

Characteristics of the study participants

A total of 384 women participated in this study. The mean age was 55.1 (SD=9.07), with 26.8% of the participants within the 50-54 age range. Additionally, 44.5% of the participants were East Indians, and 24% resided in region 4. Educational attainment was predominantly at the secondary level (49%), and 51% had no family history of breast cancer (Table 1).

Demographics and knowledge of mammography

In this study, 59.0% of the participants demonstrated good knowledge of mammography, while 41.0% had poor knowledge (Table 2). It was found that women aged 50 to 55 years were most likely to have good knowledge (27.5%), whereas those with poor knowledge were more evenly distributed across age groups, with only 11.2% in this age group. Similarly, ethnicity played a role, with East Indian participants more represented among those with good knowledge (30.3%) compared to those with poor knowledge (11.8%). When examining the region, region 4 had the highest proportion of participants with good knowledge (51.7%), though it also included 10.7% with poor knowledge. In addition, tertiary education was reported by 37.6% of the participants with good knowledge, while only 9.0% of those with poor knowledge had reached that level. Conversely, primary education was more common among women with poor knowledge (7.9%). Lastly, 32% of women with good knowledge had a positive family history of breast cancer, compared to 18.0% with poor knowledge.

Table 1: Demographic characteristics of the study participants.

Variables	Frequency	Percentage
Age in years		
40-44	38	9.9
45-49	68	17.7
50-54	103	26.8
55-59	60	15.6
60-64	49	12.8
65-69	40	10.4
70-74	26	6.8
Ethnicity		
African	109	28.4
East Indian	171	44.5
Amerindian	35	9.1
Chinese	3	0.8
Portuguese	13	3.4
Mixed	53	13.8
Region		
Region 1	24	6.3
Region 2	11	2.9
Region 3	66	17.2
Region 4	92	24.0
Region 5	57	14.8
Region 6	64	16.7
Region 7	22	5.7
Region 8	18	4.7
Region 9	11	2.9
Region 10	19	4.9
Level of education		
No formal education	27	7.0
Primary	75	19.5
Secondary	188	49.0
Tertiary	94	24.5
Family history of Breast Cancer		
Yes	151	39.3
No	196	51.0
Not sure	37	9.6

Table 2: Demographics and knowledge of mammography.

Variables	Level of knowledge		Total	P value
	Good n=105 (%=59)	Poor n=73 (%=41)	n=178 (%=100)	
Age in years				
40-44	8 (4.5)	8 (4.5)	16 (9.0)	0.000*
45-49	14 (7.9)	8 (4.5)	22 (12.4)	
50-54	49 (27.5)	20 (11.2)	69 (38.7)	
55-59	24 (13.5)	17 (9.5)	41 (23.0)	
60-64	5 (2.8)	5 (2.8)	10 (5.6)	
65-69	1 (0.6)	10 (5.6)	11 (6.2)	
70-74	4 (2.4)	5 (2.8)	9 (5.1)	
Ethnicity				
African	23 (12.9)	23 (13.0)	46 (25.8)	0.013*
East Indian	54 (30.3)	21 (11.8)	75 (42.1)	
Amerindian	7 (3.9)	7 (3.9)	14 (7.9)	
Chinese	0 (0)	1 (0.6)	1 (0.6)	
Portuguese	5 (2.8)	2 (1.1)	7 (3.9)	
Mixed	16 (9.0)	19 (10.7)	35 (19.7)	
Region				
Region 1	4 (2.2)	3 (1.7)	7 (3.9)	0.005*
Region 2	2 (1.1)	2 (1.1)	4 (2.2)	
Region 3	30 (16.9)	3 (1.7)	33 (18.6)	
Region 4	28 (15.7)	19 (10.7)	47 (26.4)	
Region 5	14 (7.9)	16 (9.0)	30 (16.9)	
Region 6	11 (6.2)	10 (5.6)	21 (11.8)	
Region 7	6 (3.4)	4 (2.2)	10 (5.6)	
Region 8	2 (1.1)	6 (3.4)	8 (4.5)	
Region 9	2 (1.1)	5 (2.8)	7 (3.9)	
Region 10	6 (3.4)	5 (2.8)	11 (6.2)	
Level of Education				0.000*
No formal education	1 (0.6)	4 (2.4)	5 (3.0)	
Primary	3 (1.7)	14 (7.9)	17 (9.6)	
Secondary	34 (19.1)	39 (21.9)	73 (41.0)	
Tertiary	67 (37.6)	16 (9.0)	83 (46.6)	
Family history of breast cancer				
Yes	57 (32.0)	32 (18.0)	89 (50.0)	0.000*
No	37 (20.8)	32 (18.0)	69 (38.8)	
Not sure	11 (6.2)	9 (5.1)	20 (11.3)	

* Significant at 0.05 level.

Knowledge of mammography by participants

In this study, although the awareness of breast cancer was high (73.4%), less than half of the participants (46.5%) were aware of mammography as a screening tool (Figure 1). The most common source of information about breast cancer and mammography was TV/radio, 56.2% and 30% respectively. This was followed by friends/family, 30.6% and 30% respectively. In addition, 42% correctly identified the definition of mammography; however, only 33.2% knew the recommended age for screening, 24.4% understood the appropriate screening frequency, 30% knew the benefits of screening, and 22.7% knew the radiation risk associated with screening. Additionally, 31.6% correctly identified the appropriate follow-up after an abnormal result.

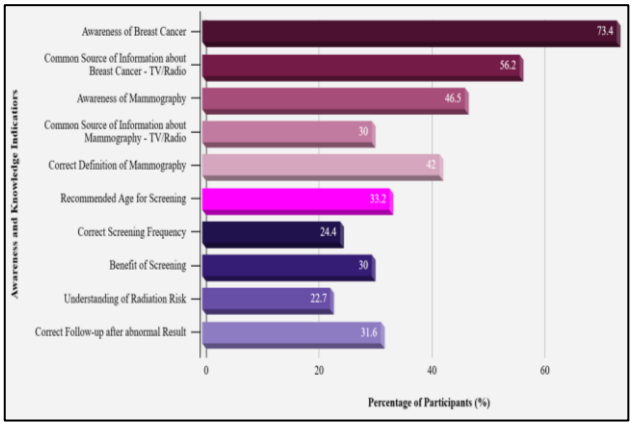

Figure 1: Knowledge of mammography by participants.

Demographics and attitude towards mammography screening

In this study, 35.4% of the participants had a positive attitude toward mammography, while 64.6% held a negative attitude. Attitude was significantly associated with age, education level, and family history of breast cancer (p<0.001) (Table 3).

Demographics and practice of mammography

In this study, among 71 participants, mammography practice was significantly associated with age, education level, and family history of breast cancer (Table 4). Women aged 50 to 54 demonstrated good practice (16.9%), with a statistically significant trend across age groups (p=0.001). Furthermore, participants with tertiary education were more likely to engage in regular screening compared to those with lower educational attainment (p<0.001). In addition, a positive family history of breast cancer was linked to better screening behavior, with those reporting such a history showing significantly higher rates of good practice (p=0.007).

Mammography screening practice by participants

Among the participants, 9.4% had a mammogram, with 5.2% having it done only once (Figure 2). Follow-up after an abnormal result was high, with 8.9% adhering to recommended care. Screening appeared to offer emotional reassurance, as 8.4% of women felt less worried after undergoing the procedure. Additionally, 6.5% would encourage others to get screened, and 5.5% expressed willingness to attend a free screening.

Table 3: Demographics and attitude of participants towards mammography.

Variables	Attitude of participants		Total	P value
	Positive n=63 (%=35.4)	**Negative n=115 (%=64.6)**	**n=178 (%=100)**	
Age in years				
40-44	6 (3.4)	10 (5.6)	16 (9.0)	0.000*
45-49	6 (3.4)	16 (9.0)	22 (12.4)	
50-54	23 (13.0)	46 (26.0)	69 (39.0)	
55-59	14 (7.9)	27 (15.2)	41 (23.1)	
60-64	4 (2.2)	6 (3.4)	10 (5.6)	
65-69	5 (2.8)	6 (3.4)	11 (6.2)	
70-74	5 (2.8)	4 (2.2)	9 (5.0)	
Level of Education				
No formal education	1 (0.6)	4 (2.2)	5 (2.8)	0.000*
Primary	5 (2.8)	12 (6.7)	17 (9.5)	
Secondary	25 (14.0)	48 (27.0)	73 (41.0)	
Tertiary	32 (18.0)	51 (29.0)	83 (47.0)	
Family history of breast cancer				
Yes	35 (19.1)	54 (30.3)	89 (49.4)	0.000*
No	22 (12.4)	47 (26.4)	69 (38.8)	
Not sure	6 (3.4)	14 (7.9)	20 (11.3)	

* Significant at 0.05 Level

Table 4: Demographics and practice of mammography by participants.

Variables	Practice of mammography		Total	P value
	Good n=26 (%=36.6)	**Poor n=45 (%=63.4)**	**n=71 (%=100)**	
Age in years				
40-44	1 (1.4)	7 (9.9)	8 (11.3)	0.001*
45-49	1 (1.4)	5 (7.0)	5 (8.4)	
50-54	12 (16.9)	11 (15.5)	23 (32.4)	
55-59	2 (2.8)	15 (21.1)	17 (23.9)	
60-64	3 (4.2)	2 (2.8)	5 (7.0)	
65-69	2 (2.8)	5 (7.0)	7 (9.8)	
70-74	5 (7.0)	0 (0)	5 (7.0)	
Level of education				
No formal education	0 (0)	2 (2.8)	2 (2.8)	0.000*
Primary	1 (1.4)	6 (8.5)	7 (9.9)	
Secondary	13 (18.3)	15 (21.1)	28 (39.4)	

Continued.

Variables	Practice of mammography		Total	P value
Tertiary	12 (16.9)	22 (31.0)	34 (47.9)	
Family history of breast cancer				
Yes	15 (21.1)	23 (32.4)	38 (53.5)	
No	10 (14.1)	14 (19.7)	24 (33.8)	0.007*
Not sure	1 (1.4)	8 (11.3)	9 (12.7)	

*Significant at 0.05 level

Motivating factors and barriers towards mammography screening

Among the 73.2% of participants who heard about breast cancer, only 9.1% had a mammogram done (Figure 3). Within this group, the primary motivations were fear of breast cancer, recommendation by someone, and experiencing a lump or pain. The reasons participants who never had a mammogram can be divided into barriers to having a mammogram and unwillingness to have a mammogram done.

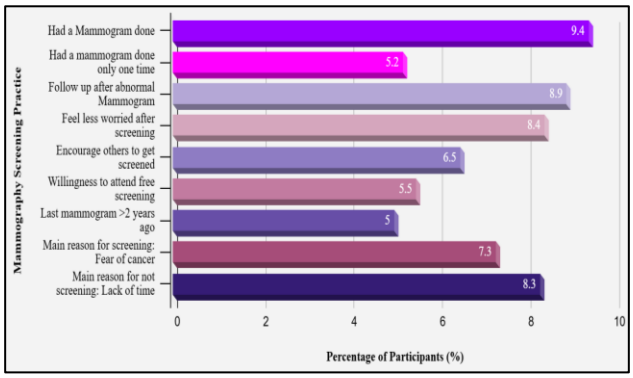

Figure 2: Mammography screening practices.

Correlation between knowledge, attitude, and practice of mammography

Pearson's correlation analysis revealed positive relationships among participants' knowledge, attitude toward mammography screening, and actual screening practices ($p<0.05$). The knowledge of the participants was moderately correlated with their attitude ($r=0.283$, $p<0.001$) and practice of mammography ($r = 0.236$, $p<0.047$). Attitude was significantly correlated with practice ($r=0.271$, $p=0.022$). In addition, of the 384 participants, 140 completed all three sections assessing knowledge, attitude, and practice. Among these, 71.4% had good knowledge, and 28.6% had poor knowledge. A total of 60% had a positive attitude, while 40% showed a negative attitude. Despite a good level of knowledge and positive attitude, only 11.4% showed good screening practice. Notably, 58.6% of those with good knowledge and a positive attitude had poor practice, and 1.4% of those with good knowledge and a negative attitude failed to engage in screening. Among participants with poor knowledge, 20% had a positive attitude but poor screening, while 8.6% had both poor knowledge and a negative attitude, resulting in poor practice. Overall, 90% of participants had poor practice.

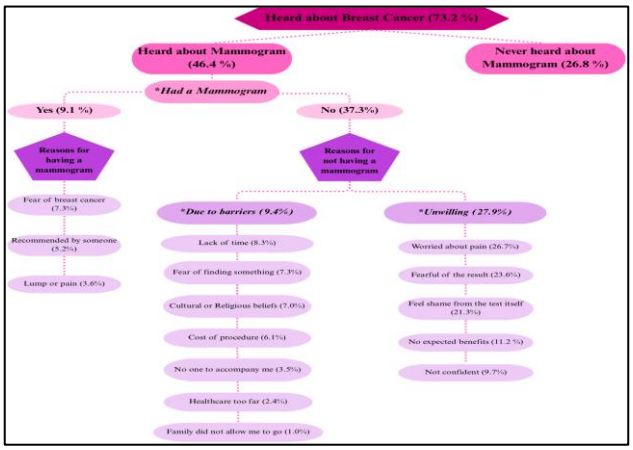

Figure 3: Motivating factors and barriers to mammography screening.

*Multiple responses allowed; percentages may exceed the total for each category.

DISCUSSION

Knowledge of mammography

The present study demonstrated that while most participants had heard of breast cancer, fewer were aware of mammography as a screening tool. Furthermore, knowledge regarding the appropriate age for screening, recommended screening intervals, benefits of mammography, radiation exposure, and follow-up after abnormal findings was limited. Similar findings have been reported internationally, where awareness of breast cancer does not necessarily translate into adequate knowledge of mammography screening.[7,8] Educational attainment was significantly associated with knowledge levels. Women with a tertiary education were more likely to demonstrate good knowledge of mammography than those with lower levels of education. This finding is consistent with previous studies, which have shown that higher educational attainment contributes to greater health literacy, increased access to health information, and improved understanding of preventive health measures.[9,10]

Attitude towards screening

Most participants demonstrated a negative attitude toward

mammography screening. Negative perceptions may contribute substantially to poor screening uptake even among women who possess adequate knowledge about breast cancer. Previous studies have similarly reported that unfavorable attitudes, misconceptions about fear, and emotional concerns can significantly reduce participation in screening programs.[11] Education also appeared to influence attitudes toward screening. Participants with higher educational attainment were most likely to report positive attitudes, suggesting that improved health literacy may enhance acceptance of preventive health services. Similar associations between education and screening attitudes have been documented in several populations.[12,13]

Mammography screening practices

Despite awareness of breast cancer screening, a notable gap was observed between knowledge and actual screening behavior, although 46.4% of women had heard about mammograms, yet only 9.1% had undergone the procedure. Similar disparities have been observed internationally, where awareness campaigns have improved knowledge but have not consistently translated into increased screening participation.[14] In addition, age, educational attainments, and family history of breast cancer were significantly associated with mammography screening practices. Women aged 50-54 years demonstrated better screening behavior than younger participants. This finding may reflect increased healthcare utilization and heightened awareness of age-related breast cancer risk among older women. Similar trends have been reported in other populations, where screening participation increases with age.[14.15] Participants with higher educational attainment were also more likely to engage in screening. Education may improve understanding of the benefits of early detection and reduce misconceptions regarding mammography. These findings reinforce the importance of health literacy in promoting preventive health behaviors.[16,17]

Motivations for Mammogram Screening

Fear of having breast cancer was the primary motivator for seeking mammograms, consistent with the findings from another study.[18] An additional motivation found in the study was the emotional reassurance provided by screening. This emotional benefit is an important but often overlooked aspect of screening. Unlike other studies, which focus primarily on the physical health benefits of mammography, this study underscores how psychological relief plays a role in women's decisions to participate in screening programs.[18]

Barriers to Screening

In this study, the most frequently reported barrier to mammography screening was lack of time. This finding is consistent with studies where women cited competing social, personal, and occupational responsibilities as reasons for avoiding general health checkups.[16,17] The second most commonly cited barrier was fear of discovering a health issue (7.3%). This aligns with findings from another study which reported that 7.5% of participants avoided screening due to anxiety about being diagnosed with breast cancer.[15-18] Similarly, studies identified fear of a cancer diagnosis as the most prevalent barrier to screening. Other barriers, such as cultural and religious beliefs, financial limitations, lack of transportation or accompaniment, and family restrictions, were highlighted.[19]

Several limitations should be considered when interpreting the findings. First, the relatively short data collection period limited the ability to recruit a large and diverse sample. Consequently, the results may not be fully generalizable to the broader population of eligible women. Moreover, this study was conducted during breast cancer awareness month, a time when public attention and advocacy efforts are at their peak. This heightened awareness may have positively influenced participants' knowledge, attitudes, and practices regarding mammography screening, potentially resulting in more favorable responses than would be typical at other times of the year. Another important limitation is the reliance on self-reported data. The accuracy of the responses depended heavily on participants' honesty, memory, and self-awareness. This introduces the risk of response bias, particularly social desirability bias, where individuals may have provided answers they believed were expected or acceptable rather than reflecting their true beliefs or behaviors. Finally, because two of the investigators participated in data collection, the study may have been subject to bias. Taken together, these limitations underscore the need for future research with extended data periods, more representative samples, and, where feasible, objective measures of screening behavior, and data collection being conducted by trained independent personnel.

CONCLUSION

This study revealed that while awareness of breast cancer and mammography was relatively high among women, actual participation in screening remained disappointingly low. Several barriers contributed to this gap, including a poor level of knowledge, negative attitudes, time constraints, fear of diagnosis, discomfort associated with the procedure, and cultural influences. Importantly, the participants' knowledge, attitudes, and practices were significantly shaped by factors such as age, educational background, and family history of breast cancer. These findings underscore the need for interventions that extend beyond awareness campaigns. To effectively boost screening uptake, strategies must incorporate emotional support, culturally tailored education, and improved access to mammography services. Finally, knowledge lies at the foundation for shaping attitudes, and it is these attitudes that ultimately drive health-related practices.

Recommendations

To effectively enhance mammography screening uptake rates among women, the following strategies are recommended:

Currently, awareness efforts peak in October and taper off afterward. To sustain momentum, the Ministry of Health could schedule quarterly mini campaigns using radio, TV, and community outreach. Partnering with schools, workplaces, and faith-based organizations would help normalize breast cancer education and screening throughout the year.

There is no evidence of systemic evaluation after campaigns. Introducing short surveys at health fairs or clinics, or health centers, would allow us to measure changes in women's knowledge, attitudes, and practices. This data could guide improvements in future campaigns.

Currently, many free mammograms are concentrated during breast cancer awareness month, limiting access for women unable to attend during that period. Thus, free mammography screening should be available year-round rather than only in October. This would reduce financial barriers and provide greater flexibility, thereby allowing women to undergo regular screening at a time that is most convenient for them, thus promoting increased uptake and early detection.

While NGOs and other organizations are involved, the structural use of influencers is limited. Partnering with popular local figures, health care advocates, and community leaders to share short educational videos and testimonials could make mammography awareness more relatable and far-reaching.

More work is needed to bring services to the hinterland and out-of-region communities. There has to be active work on having mammography screening done in the hinterlands and underserved areas, where access to health care is limited.

Implementing annual refresher courses and workshops for nurses, doctors, and community health workers would strengthen their ability to counsel women on the prevention and early detection of breast cancer.

Breast cancer education is not systematically embedded in everyday healthcare. This can be incorporated into maternal health visits, chronic disease checkups, and general consultations, making breast cancer awareness a routine part of care.

Implement a national screening registry and recall system; creating a centralized breast cancer screening registry would allow tracking of eligible women, screening participation, results, and follow-up. A recall system using phone calls or SMS reminders could further improve adherence to recommended screening intervals.

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