

The Impact of Navigation on Breast Cancer Screening Among Healthcare Workers in a Teaching Hospital in Kenya

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Received: 24 Aug 2025; Revised: 6 Oct 2025; Accepted: 7 Oct 2025; Available online: ***

Abstract

Background: Breast cancer (BC) is a significant health burden in Kenya, being the most common malignancy with the majority of cases presenting in advanced stages. BC screening has been shown to reduce mortality. Navigation services have been used to improve access to cancer care. Healthcare workers' (HCWs) knowledge and practices influence the population's health-seeking behavior. We aim to establish the impact of navigation on BC screening among HCWs in Western Kenya.

Methodology: A prospective non-equivalent control group design was used to compare mammogram screening between two groups of female HCWs before and after the introduction of a navigator in a teaching hospital in Western Kenya. Univariate analysis of variables of interest was used; chi-square and Fisher's test were applied for comparison of binary variables. A p value ≤ 0.05 was considered statistically significant.

Results: A total of 62 HCWs were studied with a mean age of 46.5 (40–54) years. The proportion of HCWs who

had a mammogram at 30 days was 40.6% in the navigated group and 0% in the non-navigated group. At 90 days, those who were navigated were 4.45 times more likely to have a screening mammogram (odds ratio: 4.45, 95% confidence interval: 1.16–17.02; $p = 0.017$).

Conclusion: Navigation resulted in better uptake of screening mammogram among HCWs in Western Kenya.

Keywords: Navigation, Screening mammogram, Healthcare workers

Ann Afr Surg. 2026; 23(3): **-**

DOI: <http://dx.doi.org/10.4314/aas.v23i3.2>

Conflict of interest: None

Funding: None

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Introduction

Breast cancer (BC) is the second most common malignancy globally and the leading malignancy in Kenya accounting for 16.1% of all cancers (1). The majority of patients in Kenya present in advanced stages, with over 60% presenting in stages 3 and 4 and only 12% presenting in stage 1 (2, 3).

Early BC screening through mammogram has been shown to be effective in reducing BC-associated mortality when done in organized population-based programs (4). Kenya has national BC screening guidelines that recommend annual mammograms between 40 and 55 years and biennial between 56 and

74 years for women with average risk for BC (5). The government of Kenya has invested in mammography screening with two-dimensional (2D) digital mammograms installed in 47 public facilities across the country (6).

Kenya lacks a population-based BC screening program with opportunistic and individual-based screening dominating (7). BC screening rate still remains low at 13.6% (8). Several barriers have been cited such as other competing interests, financial constraints, and fear of cancer-related fatalism (9, 10). In the absence of a structured screening program, when a woman visits a health facility, this poses an opportunity for a healthcare worker (HCW) to raise awareness and advise on BC screening (11). Therefore, the beliefs and practices of BC screening of HCW is likely to influence the interaction and advice given to patients. Additionally, it is also believed, knowledge and practice of HCWs on BC prevention may have a positive effect on other women in society (12, 13). Psychological models imply that screening practices within institutions are influenced by the attitudes and beliefs of HCWs (14). Additionally, HCWs play as role models in their communities and contribute to health education (13). Therefore, strategies that improve cancer screening practices among HCWs are expected to translate to better health-seeking behaviors in the general population.

Patient navigation is “a community-based service delivery intervention that aims to promote access to timely diagnosis and treatment of cancer and other chronic illness by eliminating access to care” (15). Patient navigation strives to eradicate barriers to equitable healthcare including complex medical systems, fear, and lack of trust, which are also experienced by HCWs in both developed and developing countries (12, 13, 15). Navigation services have been utilized in BC services with significant success such as screening uptake among underserved communities in developed countries and follow-up of abnormal clinical breast exam and utility of treatment facilities in developing sub-Saharan countries (16, 17). In one public teaching hospital in Western Kenya, only 5% of HCWs above 40 years had done a mammogram

in their lifetime despite the service being physically available and financially catered for by their health insurance (unpublished survey). While traditionally navigation programs in principle focus on HCWs (both in hospitals and communities) providing patients guidance through the complex healthcare system (15), we aim to explore navigation of HCWs through the system they work in. We aim to study the effect of navigation services on screening mammogram among HCWs in a teaching hospital in Western Kenya.

Study Design and Subjects

This was a prospective non-equivalent control group design comparing mammogram screening between two groups of HCWs before and after the introduction of a navigator. The study was conducted in Kisii Teaching and Referral Hospital, (KTRH) a public, level 5 facility in rural Western Kenya. The hospital serves a population of approximately 1.5 million people. KTRH has 140 female HCWs aged 40–55 years. It has a 2D digital mammogram. The study was done during the COVID-19 pandemic. Due to the study being conducted at a single site, a before and after study design was used as blinding of the groups would have been a challenge due to the risk of HCWs discussing the intervention.

The study population included female HCWs between the age of 40 and 55 years without BC signs and symptoms. A female HCW was defined as any female employee working at the hospital (18). They were further divided into clinical and non-clinical staff; clinical staff were in direct contact with the patient, while non-clinical staff were in administration or support services areas.

We excluded women with previous abnormal breast biopsy, previous chest wall radiation, first-degree relative with BC, previous BC, pregnancy, and previous mammogram scan in the preceding 12 months.

A sample size of 30 in each group was determined by a difference in proportions. Marshall et al. demonstrated a difference of 27.8% between the navigated and non-navigated women (17). Therefore, a difference of 30% was considered clinically significant in this study, and it was powered at 80%.

Informed consent was obtained from eligible participants. A baseline questionnaire was issued to understand screening practices in the past. This information was useful in tailoring the intervention in the navigated group. The before (non-navigated) group received standard care, which included registration into the out-patient database, and a mammogram request was generated on the hospital management information system. They were followed up for 30 days. Once the required number of participants in the before group had been attained and followed up, the intervention group was sequentially recruited, navigated, and observed for 30 days.

The navigation was done by a female HCW who was well versed with the healthcare system at the facility. She was trained on navigation service through an online

resource. The navigator assisted the HCW in the intervention group by scheduling mammogram appointments, calling and sending reminders, facilitating insurance process, following up on mammogram appointments, and facilitating breast clinic appointments for those with Breast Imaging Reporting and Data System (BI-RADS) ≥ 2 . The navigator also explained what was expected during the mammogram, the benefits of a screening mammogram, explored their fears and anxieties around screening mammogram, and offered to accompany the HCW to the screening appointment. The navigator additionally followed up on mammogram results and explained the outcome to the HCW. Participants in both navigated and non-navigated groups who had no mammogram by the end of the study were contacted by the navigator and reminded.

Table 1. Baseline characteristics of HCW at a teaching hospital

Variables	Non-navigated	Navigated	Total	<i>p</i> value
Age				0.048
	46.20 (4.11)	48.44 (4.59)	47.35 (4.47)	
Occupation				1.000
Non-clinical	5 (16.7%)	5 (15.6%)	10 (16.13%)	
Clinical	25 (83.3%)	27 (84.4%)	52 (83.87%)	
Years in employment	16.20 (8.41)	21.78 (9.98)	19.08 (9.60)	
Marital status				1.000
Single	1 (3.3%)	2 (6.3%)	3 (4.84%)	
Married	27 (90.0%)	28 (87.5%)	55 (88.71%)	
Divorced	1 (3.3%)	0 (0.0%)	1 (1.61%)	
Widowed	1 (3.3%)	2 (6.3%)	3 (4.84%)	
Parity				0.6524
1–3	19 (63.3%)	22 (68.8%)	41 (66.13%)	
4+	11 (36.7%)	10 (31.3%)	21 (33.87%)	
Education				0.1178
Primary	1 (3.3%)	2 (6.25%)	3 (4.84%)	
Secondary	3 (10.0%)	1 (3.13%)	4 (6.45%)	
Diploma	15 (50.0%)	25 (78.13%)	40 (64.52%)	
Undergraduate	8 (26.7%)	3 (9.38%)	11 (17.74%)	
Postgraduate	3 (10.0%)	1 (3.1%)	4 (6.45%)	
Prior history of breast cancer screening				0.8562
No	24 (80.0%)	25 (78.1%)	49 (79.03%)	
Yes	6 (20.0%)	7 (21.9%)	13 (20.97%)	

HCW, healthcare worker.

The mammograms were reported by two independent consultant general radiologists. In cases of a discrepancy, an off-site consultant breast radiologist was consulted.

The primary outcome was the proportion of mammograms performed in the navigated and non-navigated groups 30 days after recruitment. Secondary outcomes included duration to screening mammogram, outcome of mammograms, the experience of the mammogram screening, and the proportion of HCWs who had a mammogram at 90 days.

Ethical approval was sought from an Institutional Review Board (Ref: 2021/IERC-71) and a research permit was obtained from the national regulatory organization. Written consent was obtained from eligible participants before being enrolled in the study. Data were stored in a Microsoft Excel 2010 (Microsoft Corp., Redmond, WA, USA) spreadsheet and analyzed by Statistical Analysis System (version 9.4; SAS Institute Inc., Cary, NC, USA). Univariate analysis of variables of interest was used; chi-square and Fisher's test were applied for comparison of binary variables, and regression models were used to establish predictors of screening. A p value ≤ 0.05 was considered statistically significant.

Results

A total of 62 female HCWs were recruited between September and December 2021, with 30 HCWs in the non-navigated group and 32 in the navigated group. The median age was 46.2 (range: 40–54) years.

The baseline characteristics between the two study groups were similar (Table 1) except for the duration of employment and age, with those in the navigated group having a mean age of 48.44 years [standard deviation (SD): 4.59; $p = 0.048$] and mean years of employment of 21.78 years (SD: 9.98; $p = 0.021$).

The proportion of screening mammograms done at 30 days in the navigated group was 40.6% ($n=13$) compared with 0% in the non-navigated group, corresponding to an absolute risk difference of 40.6% [95% confidence interval (CI): 21.4%–59.9%; $p = 0.0001$]. After a follow-up for 90 days, the proportion of all HCWs who had mammogram was 27.4% ($n=17$). The proportion of HCWs with mammogram done at 90 days in the navigated and non-navigated groups was 40.6% and 13.3%, respectively (odds ratio: 4.45, 95% CI: 1.16–17.02; $p = 0.017$) (Table 2).

Overall, factors that were associated with screening mammogram uptake of HCW were navigation ($p = 0.017$) and age above 50 years ($p = 0.031$). The rest of the variables were not significant. Those who were navigated were 4.45 times more likely to have a screening mammogram, and HCWs above 50 years of age were 12.75 times more likely to have a screening mammogram (Table 3).

The average time between imaging request and mammogram screening was significantly shorter in the navigated group than in the non-navigated group [navigated: 3 days (SD: 2.62); non-navigated: 64 days (SD: 24.49); $p = 0.029$].

The majority (88.2%, $n=15$) of the HCWs who had a screening mammogram during the study had a normal exam, while 11.8% ($n=2$) had a benign finding. Just over half of the HCWs who were screened (52.9%) perceived the mammogram screening experience to be uncomfortable. All HCWs who had a screening mammogram would return for the test in the future, and they would also recommend this study to their friends and relatives.

The majority of the HCWs did not have a preference on the gender of the technologist who performed the mammogram screening. Forty-two HCWs (67.7%) were okay with either gender, whereas 20 (32.3%) preferred a female technologist.

Table 2. Proportion of mammogram screening in navigated and non-navigated HCW

Group	Proportion of screening mammogram % (n)	
	30 days	90 days
Navigated	40.6 (13)	40.6 (13)
Non-navigated	0	13.3 (4)

HCW, healthcare worker.

Table 3. Factors associated with screening mammogram among HCW

Variables	OR (95% CI)	p value
Navigated vs non-navigated		0.017
Non-navigated		
Navigated	4.45 (1.16–17.02)	
Age		0.031
40–44	1	
45–49	6.00 (0.58–62.04)	
>50	12.75 (1.09–148.76)	
Occupation		
Non-clinical	1	0.743
Clinical	0.78 (0.17–3.50)	
Years in employment		0.056
<10 years	1	
10–20 years	1.78 (0.18–17.62)	
>20 years	6.55 (0.57–74.65)	
Marital status		0.371
Single	1	
Married	0.62 (0.05–7.58)	
Divorced	*N.E.	
Widowed	4.00 (0.08–206.57)	
Parity		0.336
1–3	1	
4+	1.78 (0.54–5.84)	
Previous history of mammogram		0.245
No		
Yes	2.16 (0.57–8.15)	

CI, confidence interval; HCW, healthcare worker; N.E, *Not estimable; OR, odds ratio.

Discussion

Over time, navigation programs have demonstrated a positive effect in cancer-related outcomes in patients. Our study has shown a similar effect among HCWs in a rural teaching hospital. It is believed that HCWs can strongly motivate the attitudes and beliefs of women in their communities by encouraging them to have mammogram screenings (19, 20).

Navigated HCWs were more likely to have a screening mammogram. The intervention offered logistical, emotional, and psychological support and also educated the HCW on the benefits of a screening mammogram. Marshall et al. demonstrated a similar positive effect of navigation on mammographic screening among Medicare insurance beneficiaries, with those who were navigated being 2.26 times more likely to have a mammogram screening (17). Navigation programs have

also shown improved access to cancer care compared with usual care both globally and in Kenya (16, 17, 21–24). We notice that in our study there was no difference in the proportion of HCWs who had mammograms in the navigated group between 30 and 90 days. This could be due to navigation not being active beyond 30 days. Umar et al. demonstrated greater improvement in cancer outcomes when there were more navigation encounters (16).

Navigation had a linear association with duration, that is, from the doctor's request to the day of mammographic screening with the navigated staff going for the mammogram sooner than their non-navigated counterparts ($p = 0.029$). This was contrary to what was observed in another navigation program in Kenya, where the mean time from abnormal clinical breast exam in a medical camp to return to see a surgeon was not

significantly shortened by navigation ($p = 0.67$) (22). However, the effect in the current study must be interpreted in the background of a screening mammogram being an annual event and the study subjects being observed for 30 days. The true effect of the intervention will be objectively assessed if studied over a longer period (at least 1 year).

Preference for the gender of the healthcare provider has been shown to influence screening for breast and cervical cancer (25). A third of HCWs in KTRH preferred a female mammographer, similar to Taiwan nurses who cited shyness to being attended to by male clinicians (26). Similarly, cultural beliefs to preserve modesty have also been reported in other populations where women avoid their breasts being touched or viewed by others (27).

All HCWs were keen to have a screening mammogram again and would recommend it to their friends and relatives. This was in contrast to 24.1% of nurses in Singapore unwilling to have a screening mammogram, citing pain, cost, and not finding the test necessary (28). Having mammographers explain to women what to expect and being gentle during the mammogram may help alleviate the anxiety and improve the experience of the test, which may translate to better uptake (28).

Limitations to the study include the methodology not being able to control for all variables. It would have been ideal to observe the HCWs for 1 year prior to the introduction of the intervention and by lengthening the observation period after implementing navigation. Moreover, the sample size was small and not powered to objectively address all issues regarding screening mammograms and navigation. It will be ideal to have this study on a wider scale. Due to the COVID-19 pandemic and occasional industrial action in the health sector in Kenya, the priorities for most health workers were affected with most of them choosing not to participate in the study. Additionally, the cost of a mammogram scan for HCWs was catered for by their private insurance (National Health Insurance Fund for civil servants), which may not translate to the general population.

Conclusion

Navigation appeared to have a positive effect on the uptake of screening mammograms among HCWs. Navigation may therefore be adopted as an effective intervention in increasing uptake of screening mammography among HCWs, which in turn may influence the screening practices in their communities.

Author contributions

BR led in conceptualization, data curation, formal analysis, investigation, methodology, project administration and in writing, reviewing & editing of the original draft. SL led in supervision. RN equally supported.

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