

# Interventions Addressing Breast Cancer Mammography Screening Barriers in Non-Hispanic Black Women: An Integrative Review

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## ABSTRACT

Breast cancer disparity in non-Hispanic Black women is a major concern due to higher breast cancer death rates in this population. This integrative review explores interventions aimed at addressing barriers to screening mammography in this population. A literature search was conducted of full-text, peer-reviewed articles published over ten years between 2013-2023 using the Cumulated Index of Nursing and Allied Health and PubMed. Of the 396 articles identified, nine met the inclusion criteria. The studies identified used various strategies to implement screening interventions in non-Hispanic Black women that were culturally tailored and considered social determinants of health, barriers to breast cancer screening, community engagement, and patient navigation. These findings suggest that focused interventions should consider the challenges to non-Hispanic Black women to schedule and complete mammogram screenings. Future research is recommended to conduct interventional studies with non-Hispanic Black women specifically tailored to meet their needs to promote engagement in the recommended mammography screening guidelines.

**KEYWORDS:** breast cancer screening, mammography, interventions, Black or African American, or non-Hispanic Black women.

**Citation:** Neblett D et al (2023). Interventions Addressing Breast Cancer Mammography Screening Barriers in Non-Hispanic Black Women: An Integrative Review. *Cancer Health Disparities* 7:e1-e11. doi:10.9777/chd.2023.1005

## INTRODUCTION

In the United States breast cancer disparity in non-Hispanic Black women is evident with little improvement noted in reducing the gap between non-Hispanic Black women and White women. The incidence of breast cancer is higher in White women. Still, Black women have a higher chance of developing breast cancer before age 40 and are more likely to die from breast cancer (American Association of Cancer Research Steering Committee, 2022; The American Cancer Society Medical and Editorial Content Team, 2023). Breast cancer mortality rates among non-Hispanic Black women are 29.2 deaths per 100,000 persons compared with 20.6 deaths per 100,000 persons among White women (The American Cancer Society Medical and Editorial Content Team, 2023).

Non-Hispanic Black women are more likely to be diagnosed with late-stage breast cancer (Giaquinto et al., 2022 & McDowell, 2022). Mammography screening is effective for early detection, which has led to decreased mortality and improved survival. In 2019, 70.8% of Black women 40 and over reported having a mammogram within the past two years (National Center for Health Statistics (US), 2023). Along with this gradual improvement over the last several years, barriers to mammograms still exist. A recent qualitative study among non-Hispanic Black women identified the following barriers to mammogram screening in non-Hispanic Black women: fear of pain associated with the procedure, inability to make time (not a priority), socioeconomic status, employment constraints, lack of childcare, and lack of transportation (Williams & Fu, 2023). Some system barriers were identified as lack of or inadequate insurance, misconceptions about the mammogram procedure, poor communication from the medical provider, mammograms at under-resourced facilities, and a

lag in routine screening mammograms and follow-up of abnormal results (Giaquinto et al., 2022 & Williams & Fu, 2023). A study by Guo et al. (2019) also supported most of these barriers identified above as the reason for inconsistent mammogram screening in non-Hispanic Black women. Therefore, this integrative review examines the current literature regarding breast cancer screening interventions to address barriers to mammography utilization in on-Hispanic Black women.

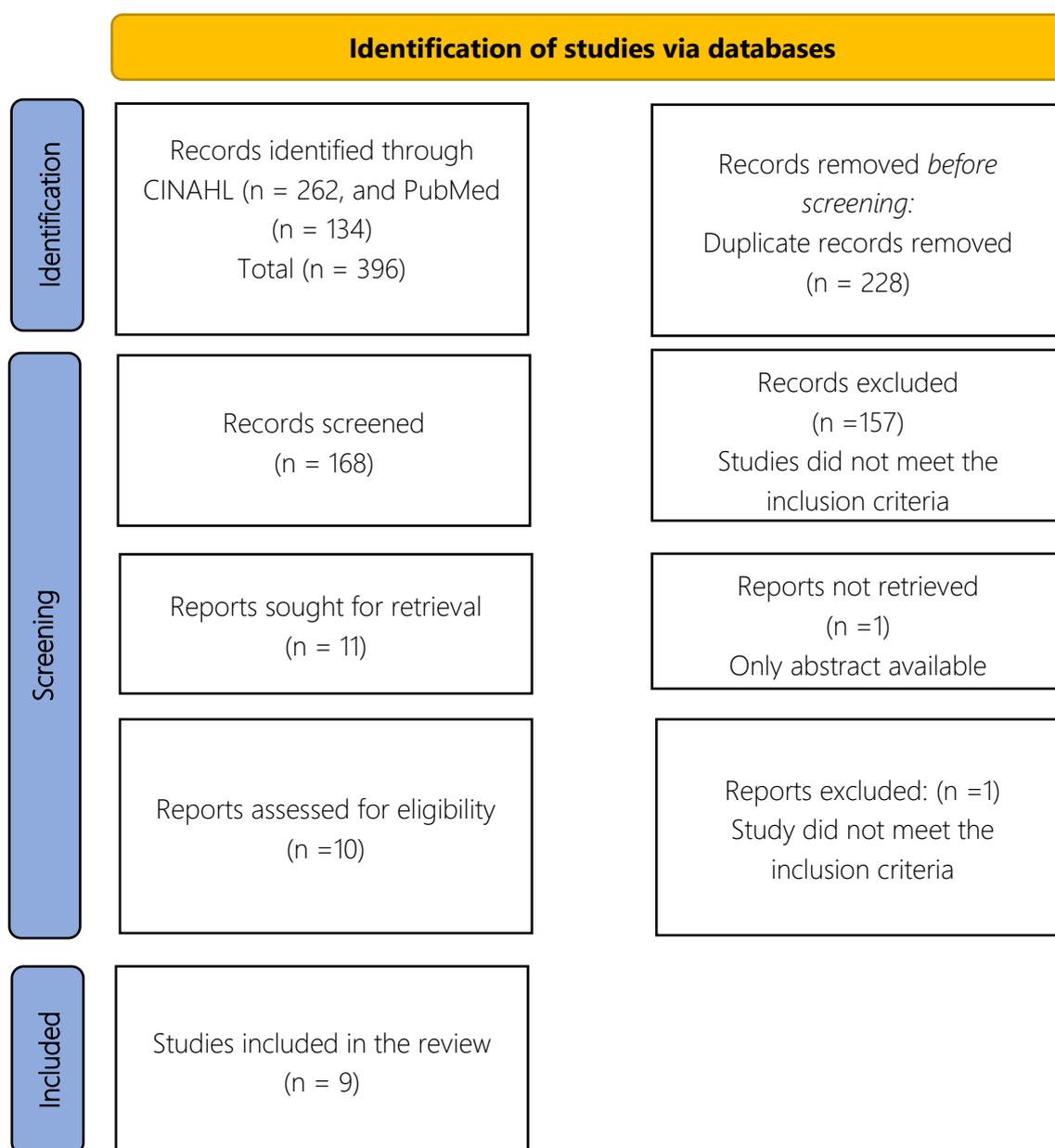
## METHODS

A literature search was conducted of full-text, peer-reviewed articles published over ten years between 2013-2023 using CINAHL and PubMed. Search terms were breast cancer, breast neoplasm, mammogram, mammography, interventions or strategies or best practices, faith-based, mobile, and navigation. The following inclusion criteria were used to identify studies in this integrative review: women who identified as non-Hispanic Black or African American, greater than 18 years of age, intervention studies (randomized and non-randomized) with reported mammogram outcomes conducted in the United States. Gray literature was not included in this review. The authors independently identified all the articles selected using the inclusion criteria. Clarification of articles selected for inclusion was resolved through discussion and consensus of both authors.

## Search Results

The database searches resulted in 396 articles, and after duplicates were removed, 168 articles remained, which were further reduced to 9 articles based on the inclusion criteria. The integrative review process was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram and is presented in Figure 1.

**Figure 1.** Flow Diagram for Inclusion and Exclusion of Studies.



## RESULTS

Table 1 provides an overview of the studies included in this integrative review. They are listed in chronological order of publication date with the author(s), study design and timeframe, study objective, sample, and outcomes. Six of the nine studies were conducted in the Southeast (Gathirua-Mwangi et al., 2016; Hatcher et al., 2016; Khaliq et al., 2017; Mayfield-Johnson et al., 2016; Mosavel & Genderson, 2016; Richman et al., 2020), three

studies in the Midwest (Allgood et al., 2018; Drake et al., 2015; Gathirua-Mwangi et al., 2016), and one in the Northeast (Hendren et al., 2014). Three studies were randomized-control trials, two were pilot studies, and four were non-randomized intervention studies. The average ages of the women in the studies ranged from 40- 69 years old. In five out of nine studies, 46-81% of the women were uninsured. Studies reported various locations for mammogram completion, such as hospitals,

imaging centers, healthcare provider offices, and community clinics. In three of the nine studies, mammogram completion was self-reported, limiting access for future comparisons or follow-up of abnormal findings. A study found that women who received a recommendation from their

medical provider were more likely to obtain a mammogram (Gathirua-Mwangi et al., 2016). About 66% of the studies in the review used multiple intervention strategies to engage participants in deciding to obtain a screening mammogram.

Table 1. Overview of Studies for this Integrative Review.

Year, Author	Study Description and Study Timeframe	Objective	Sample	Outcome
2014 Hendren et al.	Randomized Control Trial April to September 2010	To assess an intervention to increase cancer screening (*breast and colon) among patients in a safety-net primary care practice.	<i>n</i> = 366 Control group (usual care) <i>n</i> = 185 Intervention group <i>n</i> = 181 *Breast Cancer Screening (intervention and control group numbers were not reported separately) <i>n</i> = 126 women Age range 40-60+ 41% African American	Breast and colon cancer intervention and control group results were reported separately. Mammography completion: Overall, the sample was 29.7% in the intervention group and 16.7% in the control group. African American was 27.7% in the intervention group and 10.5% in the control group.
2015 Drake et al.	Non-Randomized Intervention Study 2009-2011	To implement patient navigation in a high-need area to identify women due or overdue for a mammogram and increase mammography utilization in this population.	<i>n</i> = 792 women Age range 40-69 89.3 % African American	Mammography completion in the women ( <i>n</i> = 710) who received navigation was 87.2% ( <i>n</i> = 655) of the women who were navigated and includes 55 women who had repeat mammograms in year 2 of the study.
2016 Gathirua-Mwangi et al.	Randomized Control Trial 2007-2009	To compare the effects of two interventions with usual care on mammography adherence among a subsample of African American women.	<i>n</i> = 244 Usual care ( <i>n</i> = 72) - mean age 50.6 DVD ( <i>n</i> = 87) - mean age 51.3 Telephone ( <i>n</i> = 85) - mean age 51.7	Mammography completion: Usual care – 35.2% DVD – 41% Telephone – 42.2%
2016 Hatcher et al.	Randomized Control Trial 2010-2013	To test the efficacy of a pilot intervention to increase mammography	<i>n</i> = 96 Mean age 51.9 (Age range 40-83)	Of the retained participants ( <i>n</i> = 62) who received one of the interventions, one-

		utilization among African American women recruited from those waiting in the ED.	Control group ( <i>n</i> = 33) Brochure only ( <i>n</i> = 30) Motivation interview ( <i>n</i> = 33)	quarter (27%) reported having a mammogram during the study or in the preceding three months.
<b>2016 Mayfield- Johnson et al.</b>	Non-Randomized Intervention Study/ One year	To increase the relatively low screening rate for African American women in the Mississippi Delta through partnerships with community-based organizations, state health departments, and academia.	<i>n</i> = 554 women Age range 40 - >65 94.72% African American	Mammography completion: <i>n</i> = 554 Screening mammogram – 90.43% Diagnostic mammogram – 9.57%
<b>2016 Mosavel et al.</b>	Pilot study Not included	To report on findings from a community-based study that assessed the feasibility of upward communication by adolescent females to influence their female family members to obtain recommended breast and cervical cancer screenings or to consult with their doctor regarding their need for a colonoscopy.	African American women and adolescent females 48 dyads ( <i>n</i> = 96) completed baseline interviews and 36 dyads completed the exit interviews Mean age 52 for women Mean age 15 for adolescent females Control Group <i>n</i> = 14 Intervention group <i>n</i> = 22	Mammography completion – Self-reported: Control group – 2 of the seven (29%) reported receiving a mammogram. Intervention group - 5 (42%) reported making appointments, and 5 obtained a mammogram.
<b>2017 Khaliq et al.</b>	Prospective intervention pilot study October 2012 – March 2013	To evaluate whether an intervention that includes breast cancer screening education during a hospital stay and scheduling an outpatient mammography appointment before hospital discharge would improve adherence to mammography screening.	<i>n</i> = 30 women Mean age 57.8 57% African American ( <i>n</i> = 17)	Mammography completion: 10 women (2 were African American), and five needed additional imaging and follow-up.
<b>2018, Allgood et al.</b>	Non-Randomized Intervention Study September 2011- May 2015	To assess the effectiveness of the mammogram party in increasing mammography	<i>n</i> = 3,003 women < 40 (11%) > 40 (88%) 49% African American	Mammography completion in mammogram parties (65.8%) was comparable to standard one-on-one

		uptake, particularly among under-served populations.		navigation (63.7%) but is less labor-intensive than one-on-one navigation.
2020 Richman et al.	Non-Randomized Intervention Study 2015-2017	To outline program outcomes in relation to the educational component of the program across a two-year period.	<i>n</i> = 735 women Mean age 48 23% African American	All women were educated on breast cancer; 365 women were navigated and assessed for breast health needs; 299 were either recommended for a clinical breast exam or mammogram. 193 women (65%) were recommended for a mammogram. 139 women (72%) received mammograms (data was not separated by race).
2016 Mosavel et al.	Pilot study Not included	To report on findings from a community-based study that assessed the feasibility of upward communication by adolescent females to influence their female family members to obtain recommended breast and cervical cancer screenings or to consult with their doctor regarding their need for a colonoscopy.	African American women and adolescent females 48 dyads ( <i>n</i> = 96) completed baseline interviews and 36 dyads completed the exit interviews Mean age 52 for women Mean age 15 for adolescent females Control Group <i>n</i> = 14 Intervention group <i>n</i> = 22	Mammography completion – Self-reported: Control group – 2 of the seven (29%) reported receiving a mammogram. Intervention group - 5 (42%) reported making appointments, and 5 obtained a mammogram.
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### Highlighted Components of Interventional Studies

Early detection of breast cancer reduces breast cancer mortality, and screening mammography is essential in addressing the health disparities experienced by non-Hispanic Black women who experience poorer health outcomes. Black women are 40 percent more likely to die from breast cancer and be diagnosed with aggressive cancers at younger ages (National Center for Health Statistics, 2023). Due to this finding, the 2023 *U.S. Preventive Services Taskforce* now recommends that Black women start screening at age 40. However, this change may not be enough to improve health inequities, but it is a crucial first step. Additionally, healthcare providers are vital in supporting patients through conversations about routine

mammography screening and timely follow-up and treatment when indicated (U.S. Preventive Services Taskforce, 2023). Implementing interventions focused on the specific needs of non-Hispanic Black women is essential to address the barriers impacting breast cancer screening practices among this population.

The specific interventions identified by this integrative review are summarized in Table 2. The interventions can be grouped or labeled under five areas: culturally tailored, social determinants of health, barriers to breast cancer screening, community engagement, and patient navigation. Some of the most successful programs focused on lay and community health workers and the importance of a patient navigator.

Table 2. Highlighted Components of Interventional Studies.

Culturally Tailored Interventions	Social Determinants of Health	Barriers to Breast Cancer Screening Addressed	Engaging Community	Patient Navigation
Hatcher et al., 2016	Hendren et al., 2013 Access to care	Drake et al., 2015 Resources to assist with the cost of mammogram	Hatcher et al., 2016 Lay health workers	Drake et al., 2015
Mayfield-Johnson et al., 2016	Hatcher et al., 2016 Access to care	Khaliq et al., 2017 Gift card (incentive) to offset transportation costs to mammogram	Mayfield-Johnson et al., 2016 Community Health Workers	Hatcher et al., 2016
Richman et al., 2020		Allgood et al., 2018 Transportation provided	Richman et al., 2020 Lay breast health educators	Khaliq et al., 2017
		Richman et al., 2020 Transportation provided		Allgood et al., 2018

Culturally tailored interventions were found to be important to improve mammogram screening for non-Hispanic Black women. For example, a brochure developed from focus groups with Black women in the emergency department (ED) was used to increase mammography in Black women who presented to the ED for non-urgent complaints (Hatcher et al., 2016). Mayfield-Johnson et al. (2016) described the use of multiple culturally targeted strategies in the use of media, community-based education, healthcare assistance, and use of community health workers. Another study used the Pitt County Breast Wellness Initiative-Education (PCBWI-E), using Latina and Black community members to educate the participants (Richman et al., 2020).

Understanding how other associated barriers, such as social determinants of health, affect non-Hispanic Black women's access to care is critical. Interventions in two studies provided community resources for the uninsured or underinsured, where

participants were provided free or reduced-cost screening services or assistance with co-pays through various payment sources (Drake et al., 2015; Hatcher et al., 2016; Hendren et al., 2014). Transportation to imaging centers is reported as a common barrier to mammography screening (Miller et al., 2019). Four of the nine studies addressed this barrier by offering gift cards for transportation or providing transportation either to or from the imaging center or both (Allgood et al., 2018; Drake et al., 2015; Khaliq et al., 2017; Richman et al., 2020).

The Breast Cancer and Cervical Early Detection program provides mammograms for uninsured women. Hendren and colleagues (2014) provided information about this program to the participants as part of the study's intervention, but no outcomes were reported on where mammograms were obtained. Breast and Cervical Cancer Control Program was one of three mammogram sites in a study evaluating a community-based breast cancer

prevention that allowed for tracking mammogram completion. However, locations for screening were not reported individually (Richman et al., 2020).

A third factor was using multiple intervention strategies, which can reduce barriers to cancer screening. One randomized controlled trial mailed letters and used automated telephone calls in the intervention group versus the usual care in the control group to remind African American women about obtaining a mammogram. There was a higher completion rate in the intervention group in this study (Hendren et al., 2014). Other interventions included breast health education by community health workers, mammogram scheduling, and follow-up and treatment services if indicated (Mayfield-Johnson et al., 2016). Richman and colleagues (2020) incorporated various interventions that were culturally tailored, addressed barriers to breast cancer screening, and engaged the community.

A fourth factor was the importance of support and education within the community. Three studies engaged community members through lay health workers, community health workers, and lay breast health educators (Hatcher et al., 2016; Mayfield-Johnson et al., 2016; Richman et al., 2020). Community health workers were recruited from the community where the research would occur. They served as gatekeepers due to their familiarity with the needs and health issues of the community.

Lastly, patient navigation was identified in four studies (Allgood et al., 2018; Drake et al., 2015; Hatcher et al., 2016; Khaliq et al., 2017). The patient navigator's tasks varied. Some of the duties included educating women about breast health and breast cancer, identifying women who need mammograms, scheduling mammograms, assessing for any barriers to adherence, assisting with resources to address these barriers, supporting

women regarding the results, and following up on abnormal mammography results (Allgood et al., 2018; Drake et al., 2015; Hatcher et al., 2016; Khaliq et al., 2017; Richman et al., 2020). One study compared navigation using a mammogram party versus one-on-one navigation and found comparable completion rates. However, mammogram parties can foster a sense of community among the women and provide support within the party members through the shared experience of having a mammogram on the same day. More mammograms can be completed in mammogram parties versus one-on-one navigation. This same study reported a range of total navigation contacts of 10.9 in women invited to a mammogram party and 15.0 in women not invited to a party (Allgood et al., 2018). Patient navigation was first used to address barriers in cancer care in 1990 and continues to have support as an effective strategy to promote early detection and treatment (Stringer-Reasor et al., 2021).

## DISCUSSION

Mammography screening is an effective tool for early detection of breast cancer and a means to improve the health outcome of non-Hispanic Black women. Breast cancer disparity gaps that are still prevalent today must be addressed to reduce this population's higher breast cancer death rate. Healthcare providers must recognize and be willing to improve how they relate and communicate with non-Hispanic Black women, which could foster better adherence to mammogram screening. A free CME toolkit, "Talking to Patients about Breast Cancer Screening," on the American College of Radiology website is available for healthcare providers. The toolkit includes clinical decision aids, education handouts about breast cancer, infographics, and clinical education videos (American College of Radiology, n.d.). In addition, a study by Fung et al. (2021) supports that more

culturally and linguistically targeted education is needed to increase mammogram screening among non-Hispanic Black women.

The healthcare community should consider challenges to breast cancer screening for non-Hispanic Black women, such as childcare, and incorporate effective measures to address this issue. Taking time off from work is a significant concern. Offering screening schedules in the evening or on weekends so women would not have to lose income from taking time off from work could improve non-Hispanic Black women's adherence to screening. Consideration of these interventions is needed to reduce the higher breast cancer death rates in non-Hispanic Black women. Other issues to address breast cancer screening disparities are advocating for affordable health insurance, supporting safety-net facilities that provide breast cancer screening, and partnering with leaders in healthcare systems for mammography and patient navigation services (Stringer-Reasor et al., 2021).

There are limitations to consider in this integrative review. Barriers to early detection of breast cancer are multifaceted. This review focused on interventions addressing barriers to mammography screening in non-Hispanic Black women, which did not allow for comparison. The studies' socioeconomic and insurance status varied, with many uninsured participants. The long-term effects of the interventions are not known. Breast cancer diagnosis, treatment, and survivorship were not included. Despite these limitations, the review highlighted strategies to address barriers to mammography screening in non-Hispanic Black women.

The findings from this review emphasize the significance of accepting, understanding and addressing the cultural differences and the multi-level barriers (social determinants of health) that

contribute to a non-Hispanic Black woman not being able to or not obtaining a mammogram as recommended. In addition, the 2023 *U.S. Preventive Services Taskforce* now recommends that Black women start screening at age 40. Future studies should consider incorporating measures to track mammogram completion versus self-reporting. More longitudinal interventional studies tailored to non-Hispanic Black women are needed to support their engagement in mammogram screening guidelines for early detection of breast cancer.

## Acknowledgments

The authors thank Dr. Debra Wallace for her editorial support.

## Author Contributions

Conception and plan for integrative review: DN and WW.

Initial manuscript writing, review, and revisions: DN and WW.

## Conflict of Interest

The authors declare that they have no conflicts of interest with the contents of this article.

## Funding

There was no funding support for this integrative review.

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