

# Timely Mammography Use among a Sample of Black American Women: A Community-Based Study

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## Abstract

Breast cancer deaths are more common among Black American women than White women. In 2012, the Centers for Disease Control and Prevention reported that Black American women had a higher incidence rate (130.0) compared to White women (128.9). But it is the double burden of incidence and low survival that is particularly alarming (American Cancer Society, 2011). While research is underway to better understand the role that genes play, such as those that are associated with the aggressive triple negative breast cancer which is more commonly diagnosed in Black American women, there is more to learn about the utilization of the screening mammography. At the time this study was conducted the age controversy to receive a baseline screening was just beginning. The American Medical Association, the American College of Radiology, and the American Cancer Society all supported baseline screenings at age 40 but, currently the United States Preventive Services Task Force guidelines recommend biennial screening for women aged 50 to 74 years who are at average risk for breast cancer. Furthermore, mammograms are not routinely recommended for women age 40 to 49 because they are more likely to have false biopsies. We do not yet know the long-term impact of implementing a longer timeline to screen for breast cancer. Although Black American women, have narrowed the gap, they still lag behind regarding mammography screening and are more likely to be diagnosed with an aggressive form of breast cancer. This paper investigates the predictors of mammography use among a small, low-income, U.S. community-based sample of Black African American women age 42 and older.

## Keywords

Breast Cancer, Black American Women, Mammography Screening

## 1. Introduction/Background

Since 2001, trend data indicate that annual female breast cancer deaths have been declining [1]. However, not all women have benefited from this encouraging news. Compared to their counterparts, Black women have higher mortality rates following a breast cancer diagnosis. Researchers agree that an important reason for these alarming facts is that later-stage diagnosis is highly correlated with low survival [2] [3]. As a result, the literature has overwhelmingly focused on mammography utilization. Mammography is the best method for detecting breast cancer at a stage when it can be most effectively treated.

To offer a unique perspective on timely mammography use, we designed the study to examine within group comparisons. We recruited a community-based sample of only Black women 42 years of age and older who were seeking care at a clinic. The age of the women is important because in order to comply with the United States Preventive Services Task Force mammography recommendations, the participants were expected to receive a baseline mammogram within 1 - 2 years of their 40th birthday. We selected the Health Belief Model (HBM) as the theoretical framework because it has been used extensively to examine mammography behavior [4] [5] [6] [7] [8]. Furthermore, because the participants are all Black women, we adopted a valid and reliable instrument that was developed by Champion & Scott [9] specifically for Black/African American women to measure the Health Belief Model constructs. The need for culturally specific measures suggests a movement towards personalized, population-based interventions [10]. We aimed to identify factors that were associated with and predictive of timely mammography behavior among the community-based sample of Black women.

## 2. Methods

The design was a cross-sectional study. For this project, we employed a method we termed, *survey interview*. The Principal investigator (PI) read each question aloud from a hard copy and marked the participants' responses directly on it. To facilitate recall, the participants were given response cards that displayed the answer options, such as "Strongly Agree, Agree, Undecided/Neutral, Disagree, and Strongly Disagree". This approach has the following benefits: it mitigates potential literacy differences and it reduces missing data.

### 2.1. Clinic Site and Recruitment

The geographic location of this study is Wayne County, Michigan. According to the Behavioral Risk Factor Surveillance Survey 1995-1999, the rate of appropriately timed mammography screening was 53%. It represents the lowest rate compared to five other counties (e.g., Ingram, Kent, Macomb, Oakland, and Washtenaw). The study took place at an obstetrics & gynecology clinic in the city of Detroit. The clinic operated weekdays (8:00 a.m. - 3:00 p.m.). In any given week, 70% of the women were seeking prenatal care and the remaining 30% were seen for gynecological care (e.g., Pap test) and/or family planning services.

In addition to these health services, the clinic hosted specialty care days for women managing conditions, such as: diabetes, HIV, and high-risk pregnancy.

The pilot test revealed that the average clinic wait time was 45 minutes. Therefore, because the survey interview lasted 20 - 30 minutes, depending on the participants' responses, it did not interfere with the clinic's schedule flow. This research had two recruitment phases to comply with the clinic's implementation of the Health Insurance Portability and Accountability Act (HIPAA). The difference between Phase I and Phase II was how the women were recruited for the study. The majority of the participants were recruited during Phase I. Phase I recruitment occurred between March 2003 and June 2003. The procedure was for the clerks to inform the women about the study when they checked in for their appointment. A total 110 women were recruited during this period. An updated Institutional Review Board (IRB) application was submitted in July, approved in August. Phase II recruitment occurred between September 2003 and October 2003. The new procedure required flyers to be posted in the waiting room, which would allow the women to see them and express their interest to the clerk when they checked in for their appointment. Women who wanted to learn more information met with the Principal Investigator (PI). A total of 43 women were recruited during this period for a total of 153 completed survey interviews.

## 2.2. Participant Eligibility

To be eligible to participate, the women had to have an appointment scheduled on the day of the interview, self-identify as Black, speak English fluently, and confirm that they were 42 years of age or older.

## 3. Data Collection

Women who consented to participate were interviewed during their wait time prior to their scheduled clinic appointment. Participants were informed that they would receive a \$25 financial incentive for their participation and information about the current mammography recommendations courtesy of the Karmanos Cancer Institute.

Each survey interview asked the participant two questions to measure mammography timeliness. "*Have you ever had a mammogram?*" and "*Have you had a mammogram within the last two years?*" The dichotomous responses were (1 = yes and 0 = no).

To comply with the United States Preventive Services Task Force recommendations, all of participants met the age criteria to receive a baseline mammogram because they were 42 years of age and older. Therefore, women were coded as untimely if they fit either of the following conditions: 1) they had not yet ever received a mammogram and 2) they had not received a recent mammogram (within the last two years).

We wanted to better understand the factors that influenced mammography

timeliness among this sample of Black women. The Health Belief Model (HBM) that was introduced by Rosenstock [11] and was updated by Champion and Skinner [9] to measure the socio-cultural realities of Black women. From the Champion and Skinner instrument we included: perceived benefits, perceived barriers, and perceived susceptibility. The cues to action construct examined two types of influence—social influence (e.g., family and friends) and physician influence.

### 3.1. Health Belief Model Constructs

#### 3.1.1. Perceived Benefits

Four items measured the perceived susceptibility construct. These items were about one's perception of mammography efficacy and its ability to decrease one's chances of dying from breast cancer.

#### 3.1.2. Perceived Barriers

Fourteen items measured the perceived barriers construct. These items addressed a variety of challenges including: fear, embarrassment, scheduling, transportation, rude treatment, financial cost, pain, radiation, caregiver responsibilities, and competing problems.

#### 3.1.3. Perceived Susceptibility

Five items measured the perceived susceptibility construct. The questions assessed risk and one's perception of a breast cancer diagnosis currently, in next few years, in the near future, and during one's the lifetime.

### 3.2. Cues to Action

#### 3.2.1. Social Influence

Allen [12] describes social influence as “those who perceive that social network members (*i.e.*, relatives, friends, or co-workers) with whom the respondent felt close are supportive of mammography screening” (pp. 476-478). Social influence suggests that advice from others does have an effect on the likelihood of action. The effect can be positive or negative. This study employed the Social Influence Index Scale [12]. The Social Influence Index has three components and each examines the role of the social network members on mammography behavior for the participant. The first component assesses the subjective norms regarding the social network members' approval of mammography use and the degree of the social network members' influence on the participant. It consists of two items. Item 1: “*How does your family or those close to you feel about your having a mammogram?*” (*Strongly agree, Agree, Uncertain, Disagree, Strongly disagree*). Item 2: “*How much does the opinion of your family or persons close to you influence your decision about having a mammogram?*” (*Very much, Somewhat, Not very much, Not at all*). The second component assesses whether a member of the social network had encouraged the participant to have a mammogram. “*Has a friend, family member, or co-worker ever encouraged or advised you to have a mammogram?*” (*Yes, No*). The last component measures the

perceived norms about mammography screening and it is: “*Thinking about the women you know, who are your age, how many get mammograms every 1 - 2 years?*” (*Most, Some, A few, None/don't know*).

### 3.2.2. Physician Influence

Previous research has found that having one’s physician recommend a mammogram increases the odds that a woman will comply. Physician influence was measured with two question items: “*Has your doctor talked with you about the early detection of breast cancer?*” (*Yes, No*) and “*Has your doctor discussed mammograms with you?*” (*Yes, No*).

## 4. Results

The final sample size is 151; two cases did not meet the eligibility criteria. We used SPSS to conduct the statistical analyses: sample distribution, significant independent samples t-test, and logistic regression analysis.

**Table 1** shows the demographic distribution of the sample. The women ranged in age from 42 to 82 with a mean age of 49.8 years. Approximately, 67% of the sample had up to a high school diploma. Seventy-three percent reported a household income of less than \$24,999 for the last 12 months. Similarly, nearly half (42)% of the participants were unemployed at the time of this study. To manage health care, 40% were Medicaid recipients and 14% were enrolled in the Breast and Cervical Cancer Control Program (BCCCP). The top three health conditions reported among the sample were: benign cysts/fibroid tumors (54%), hypertension (50%), and arthritis (42%).

**Table 1.** Demographic distribution among the sample.

	Frequency N = 151	Percentage
Age		
• 42 - 49	99	66%
• 50 - 64	44	29%
• 65+	8	5%
Highest level of education completed		
• Less than High School	49	32%
• High School	51	34%
• Trade School	4	3%
• Some College	39	26%
• College	8	5%
Annual Household Income		
• Less than \$5000	51	34%
• \$5000 - \$7499	30	20%
• \$7500 - \$9999	16	11%
• \$10,000 - \$12,499	13	8%
• \$12,500+	37	25%
• Don't Know/RF	4	2%
Job Status		
• Full-time	27	18%

**Continued**

• Part-time	18	12%
• Retired	10	7%
• Unemployed	64	42%
• Disability Status	32	21%
Health Insurance Status		
• None/Self pay	9	6%
• Medicaid	61	40%
• Medicare	6	4%
• Both Medicaid and Medicare	13	9%
• County Medicaid	32	21%
• BCCCP+	21	14%
• Other	9	6%

\*Breast and Cervical Cancer Control Program.

**Table 2** shows the results of the analysis indicate that four significant variables were associated with timely mammography use: age, income, and two perceived barrier items. Older women were almost three times more likely to have received a timely mammogram. Of all of the Health Belief Model constructs, two barriers items reported strong evidence for mammography use. 1) If a woman knew how to schedule a mammogram and 2) If she did not perceive other problems as more important than getting a mammogram.

**Table 2.** Factors associated with timely mammography use among the sample.

Variable	T statistic	Mean	Standard Deviation	P value
Age	2.998	0.4301	0.4977	0.003
Income	2.062	1.4516	0.71500	0.042
I know how to go about scheduling a mammogram.	5.228	4.26	0.706	0.000
I have other problems more important than getting a mammogram.	-3.900	1.80	2.19	0.018

P value is < 0.05 independent samples t-test.

**Table 3** shows the results of the same data entered into a logistic regression analysis to determine the strongest predictors of timely mammography use among the sample. The results closely mirrored the independent samples t-test; the only variable that was omitted was income.

**Table 3.** Factors that predict timely mammography use among the sample.

Variable	B	Odds Ratio	Wald Statistic	P value
Age	0.866	2.377	3.828	0.050
I know how to go about scheduling a mammogram.	1.009	2.743	19.502	0.000
I have other problems more important than getting a mammogram.	-0.855	0.425	11.894	0.001

P value is < 0.05 logistic regression analysis.

Overall both analyses show that age, scheduling confidence, and perceiving

the mammogram as a priority screening tool play a role in timely mammography receipt.

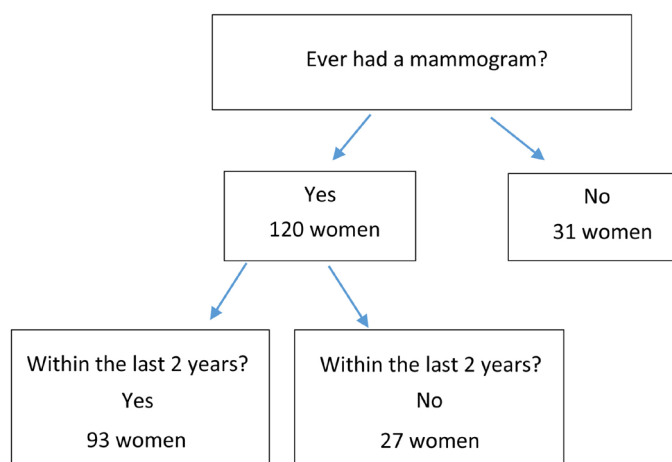
## 5. Discussion

We found three factors that were associated with and predictive of ever and recent use of mammography among the sample: age, knowing how to schedule a mammogram, and not having other problems more important than getting a mammogram. As women age, they are more likely to receive a mammogram. Physician influence was measured, but it was not found to be significant. However, we wonder how physicians (or nurses) contribute to how women know how to schedule a mammogram. For example, if we consider the present-day, a physician can give a referral (handwritten or digital/online via My Chart software), that allows either a mammography facility to contact the woman or the woman contacts the facility then that promotes scheduling. However, when this study was conducted such technology was either not developed or not widespread including at the clinic site. Similarly, the Breast and Cervical Cancer Control Navigation Program (formerly known as Breast and Cervical Cancer Control Program—BCCCP) may have eased scheduling access which accounted for 14% of the sample. It was implemented through the Michigan Department of Community Health in 1991 with a multi-year grant from the Centers for Disease Control and Prevention. This program provides free mammograms and Pap testing to qualifying women. We are unable to state with certainty how the women knew how to schedule a mammogram, however we acknowledge that such information could have come from any variety of sources including, commercials campaigns, family, friends, co-workers, posters, and direct mail, to name a few. In addition, although the women may have had competing responsibilities, the findings suggest that they regarded getting a mammogram as a priority. The income variable was associated with mammogram receipt but not predictive of it.

Mammography utilization is far more complex than this study explores. When Black women do not receive mammograms according to the recommendations, they are often referred to as non-compliant or non-adherent—terms that may imply conscious decision-making. This assumption omits the impact of major life events. Major life events such as divorce and job loss were anecdotally relevant to timely mammography usage among the sample. For example, suppose a woman had a baseline mammogram at 40, however when the time came to receive the next one she was among the 42% who reported being unemployed. She must renegotiate access to care—not only for a mammogram but for all of her medical needs. We invite readers to speculate how women who experience major life events can avoid a disruption of medical care. It is important to note that during this research, funding was temporarily suspended for the BCCCP. How many women attempted to enroll, but could not? How many women, who would have received care during this time did not? How many women needed to

be diagnosed and treated during this time and were not? In order for mammograms to be an effective, gold standard screening tool, they must be repeated and the medical records/mammography results must be compared year-to-year by a radiologist to notice any breast tissue abnormalities.

At the time of this study, the United States Preventive Services Task Force [13] recommended baseline mammograms to begin at age 40 years. Therefore, by setting the age eligibility for the study at age 42 years, we allowed a window for mammography receipt. **Figure 1** shows among the sample, 80% (120 women) reported receiving a baseline mammogram. Of the 120, ninety-three or 77% reported that they had received another mammogram within the last two years. Overall, these data were very encouraging.



**Figure 1.** Mammography use among the sample.

### 5.1. Limitations

We acknowledge that the sample size was small  $N = 151$  which may not generate enough power to concretely stand side-by-side with larger and/or national data sets. Still, the benefit of community-based samples is to identify challenges that can be addressed by tailoring interventions to the needs of that population. In addition, we know that “Black” is a socially-derived construct intended to join groups that are likely to share life experiences, however because race is based on physical characteristics, we are unable to discuss unique cultural aspects that may influence the perception of the health care in the U.S. among women who identify as Black but are dually Haitian, African, Caribbean, or African American, for example. We believe that within group longitudinal studies that explore how Black women access mammograms prospectively are essential to provide evidence about tailored interventions.

### 5.2. Implications and Conclusion

The U. S. health care has improved the technology with the emergence of the 3-dimensional mammography in 2011 [14] and the science, with the discovery of triple negative breast cancer that aggressively shortens the lives of women,



particularly young Black women. Black women continue to suffer disproportionately from breast cancer deaths, with an 8% differential between Black and White women. Black women (28%) and White women (20%), Hispanic (14%), and American Indian/Alaskan Native (12%), and Asian/Pacific Islanders (12%) [1]. The disparity in breast cancer survival for Black American women is not fully explained by mammography use, still early detection matters.

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## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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