

# Family Matters in Mammography Screening among African-American Women Age $\geq 40$

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*Purpose:* To examine how family history of cancer influences the mammography screening behaviors of asymptomatic African-American women.

*Methods:* Using the National Health Interview Survey's 2000 Cancer Control Module, the authors performed bivariate analyses and multivariate logistic regressions with SAS/SUDAAN due to the complex sampling design.

*Results:* Of the 1,531 African-American women in the final sample, 38% had a family history of cancer. Women with a family history of cancer were 39% more likely to have a recent mammogram compared to women with no family history of cancer (OR=1.39; 95% CI: 1.06–1.81;  $p < 0.05$ ). Eighty-five percent of African-American women aged  $\geq 40$  with a family history of cancer indicated having a mammogram in the past compared to nearly 70% of African-American women without a family history of cancer.

*Conclusion:* Family history of any cancer independently and positively predicted mammography screening behaviors among asymptomatic African-American women. This suggests that African-American women with a history of cancer in their family are more likely (and perhaps more motivated) to engage in early cancer detection practices.

**Key words:** mammography ■ screening ■ African Americans ■ women's health

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## INTRODUCTION

**B**reast cancer accounts for the second largest number of cancer-related deaths among women.<sup>1</sup> The breast cancer mortality disparities that exist between African-American and Caucasian women are

well documented.<sup>2-4</sup> During the 1990s, female breast cancer mortality rates were highest for African Americans compared to other racial and ethnic groups.<sup>1,5</sup> While breast cancer-related mortality rates decreased in whites (2.5% per year) and Hispanics (1.2% per year), they were unchanged for blacks, American-Indian/Alaska natives and Asian/Pacific-Islander women.<sup>1,5</sup>

Medical experts attribute the general decline in breast cancer deaths to more effective treatments, and earlier detection by mammography.<sup>5-7</sup> Research has shown that the early detection of breast cancer by screening mammography greatly improves a woman's chances for successful treatment.<sup>5-7</sup> For this reason, it is argued that increasing the use of mammography in African-American women is likely to reduce breast cancer mortality disparities. Hence, several interventions have been designed to increase mammography utilization by African-American women. Despite many such interventions, many African-American women still do not engage in breast cancer screening.<sup>4,8,9</sup>

In an effort to understand why many African-American women do not engage in breast cancer screening and how they might be encouraged to increase their utilization of mammography screenings, studies have examined the different factors which influence mammography screening behaviors among asymptomatic African-American women. Provider recommendation has been identified as one strong predictor for increasing screening behavior.<sup>9-15</sup> Other important factors identified are risk factors which entail self-perception of risk, smoking status and alcohol intake.<sup>9-15</sup> Other studies stress the importance of taking a holistic approach in encouraging women to engage in breast cancer screening practices.<sup>16,17</sup> This approach includes discussing topics such as nutrition, the environment, stress reduction, and spiritual and emotional well-being.<sup>18</sup> Barriers to screening identified in these studies include factors associated with lower socioeconomic status (SES) such as insurance coverage, education and place of residence.<sup>4,8,9</sup>

This study represents a unique contribution to existing research by examining the role of family history of cancer as a potential predictor of mammography screen-

ing behaviors among African-American women. Murabito et al. showed that family history of breast cancer is a strong predictor of mammography use in women aged 40–79.<sup>19</sup> However, their analysis is limited to one specific type of cancer (breast), and it does not investigate differences across racial and ethnic groups. This study extends our understanding of the role of family history of cancer beyond just breast cancer and analyzes the effect of any type of cancer history on African-American women's mammography use.

The traditional model for predicting mammography screening, in which Caucasian women are the referenced group, may not fully explain the cancer screening behaviors and may conceal heterogeneity among African-American women. While Gross et al. found that white women reported higher rates of mammography use by analyzing data drawn from the same source as this study, their analysis of predictors of mammography screening used the traditional model and did not investigate within-race comparisons.<sup>20</sup> Gross et al. used data

**Table 1. Sociodemographic characteristics of asymptomatic African-American women age ≥40 (N=1,531)**

	With Family History of Cancer (n=588)	Without Family History of Cancer (n=943)	Total (n=1,531)	P Value
	N (%)	N (%)	N (%)	
Age Category				
40–49 years	198 (33.7)	401 (42.5)	599 (39.1)	
50–64 years	160 (27.2)	237 (25.1)	397 (25.9)	
≥65 years	230 (39.1)	305 (32.3)	535 (34.9)	0.0069
Income, % Poverty <sup>a</sup>				
<100% FPL	553 (94.0)	863 (91.5)	1,416 (92.5)	
100% FPL–199% FPL	24 (4.0)	61 (6.5)	85 (5.6)	
≥200% FPL	11 (1.9)	19 (2.0)	30 (2.0)	0.4241
Education				
Less than high school	181 (30.8)	303 (32.1)	484 (31.6)	
High-school graduate	273 (46.4)	411 (43.6)	684 (44.7)	
More than high school	133 (22.6)	211 (22.4)	344 (22.5)	0.9732
Marital Status				
Married	157 (26.7)	229 (24.3)	386 (25.2)	
Widow/separated/divorced	338 (57.5)	519 (55.0)	857 (56.0)	
Never married	93 (15.8)	195 (20.7)	288 (18.8)	0.0273
Urbanicity (MSA)				
≥2,500,000	190 (32.3)	348 (36.9)	538 (35.1)	
2,499,999–100,000,000	162 (27.6)	227 (24.1)	389 (25.4)	
999,999–250,000	121 (20.6)	183 (19.4)	304 (19.9)	
<250,000	115 (19.6)	185 (19.6)	300 (19.6)	0.6444
Region				
Northeast	97 (16.5)	204 (21.6)	301 (19.7)	
Midwest	107 (18.2)	172 (18.2)	279 (18.2)	
South	313 (53.2)	496 (52.6)	809 (52.8)	
West	71 (12.1)	71 (7.5)	142 (9.3)	0.0325
Health Insurance Type				
Private	288 (49.0)	474 (50.3)	762 (49.8)	
Public	232 (39.5)	315 (33.4)	547 (35.7)	
No health insurance	68 (11.6)	154 (16.3)	222 (14.5)	0.0013
Smoking Status				
Current smoker	126 (21.4)	217 (23.0)	343 (22.4)	
Former smoker	124 (21.1)	139 (14.7)	263 (17.2)	
Never a smoker	336 (57.1)	568 (60.2)	904 (59.0)	0.0804
Mammogram, Recent				
Had a recent mammogram				
Did not have a recent mammogram	302 (51.4)	395 (41.9)	697 (45.5)	
	286 (48.6)	548 (58.1)	834 (54.5)	0.0069
Mammogram, Ever				
Ever had a mammogram	500 (85.0)	661 (70.1)	1,161 (75.8)	
Never had a mammogram	88 (15.0)	282 (29.9)	370 (24.2)	0.4241

a: According to the Year 2001 Federal Poverty Line (FPL); MSA: Metropolitan statistical area

constructed in a way as to combine African-American women with women of other racial and ethnic groupings. Given the heterogeneity and diversity among African-American women, this data construction strategy may fail to fully elicit predictor effects on African-American women's mammography use. Thus, it is important to make comparisons among African-American women to note important differences. Therefore, we focus only on the behaviors of African-American women aged  $\geq 40$  to make within-group comparisons.

We must expand the understanding of this heterogeneous population in order to design appropriate interventions to increase screening utilization and earlier detection in this group, and thus improve prognosis (and potentially) reduce the observed disparities. As more studies focus solely on African-American women, more insight will be gained into the social, economic and cultural diversity within African-American women,<sup>21</sup> and variables of importance will surface.<sup>22</sup> The guiding research question in this study was: Does knowledge of one's family's history of cancer make a difference in the prevention screening practices of African-American women?

This study evaluates the effect of family history of any cancer (in the context of other established barriers and predictors of screening rates) on mammogram utilization in asymptomatic African-American women.

**METHODS**

The Cancer Control Module (CCM) of the 2000 National Health Interview Survey (NHIS) was used to analyze the differences in mammography screening practices of asymptomatic African-American women age  $\geq 40$  years with and without an immediate family history of any cancer. The NHIS is a multipurpose health survey conducted by the National Center for Health Statistics (NCHS), a department of the Centers for Disease Control and Prevention (CDC). The NHIS data contain information on basic health and demographic issues as well as current health topics.<sup>1</sup>

In 2000, NHIS and the National Cancer Institute funded a CCM that was designed to monitor trends in cancer behavior risk factors and cancer screening. The CCM, from which we purposively drew our subsample of analysis, is a cross-sectional household interview

survey involving continuous sampling and interviewing throughout year 2000. It uses a multistage area probability design to represent the civilian noninstitutionalized population of the United States. In the first stage, a sample of 358 primary sampling units is drawn from approximately 1,900 geographic sampling areas in the 50 states of the United States and the District of Columbia. In the second stage, two types of sampling units are used: area segments consisting of an expected eight or 12 addresses and permit area segments that cover geographic areas where houses built after the 1990 census are located. Within these two segments, uninhabited households are targeted for interview (NCHS).<sup>23</sup> Given this complex sample design and our purposive subsampling technique, data were appropriately weighed using software for the Statistical Analysis of Correlated Data (SUDAAN) subpopulation statement in all statistical analyses. This was done to adjust for selection bias that may arise from the CCM sample design and our purposive subsampling.

**Sample Subjects**

For this study, only African-American women that are asymptomatic and  $\geq 40$  years of age were included in the analysis. Drawing this subsample from the initial 32,374 adult observations in the CCM data set resulted in a sample size of 1,531. We restricted our analyses to women age  $\geq 40$  because the American Cancer Society recommends that all women age  $\geq 40$  should have annual screening mammograms; this is deemed the relevant age group of analysis. Because breast cancer is more prevalent in women than men and higher mortality rates are recorded for African-American women, we chose to include these as selection variables. Whether women are asymptomatic or not constitutes the other selection variable, as asymptomatic women are the population group likely to benefit from adhering to mammography recommendations.

**Variable Definitions**

**Outcome variables.** To assess the mammography screening practices, two dichotomous outcome variables were defined: mammogram ever and mammogram recent. Recoded variables specifying month since

**Table 2. Age-adjusted rates of mammography use**

Age Category	Mammogram Ever		Mammogram Recent	
	Yes	No	Yes	No
40–49 years	421 (69.6%)	178 (30.4%)	247 (42.5%)	352 (57.5%)
50–64 years	392 (82.4%)	68 (17.6%)	215 (52.8%)	182 (47.2%)
$\geq 65$	411 (77.9%)	124 (22.1%)	235 (44.3%)	300 (55.8%)
All ages	1,161	370	697	834
CMH p value	0.0426		0.0098	

last mammography screening test were used to create these variables in relation to cancer screening behaviors. Women who self-reported mammogram ever screening were coded as 1 and 0 if there was no self-report of a mammography screening history. Women who reported recent mammography screening (within the last 12 months) were coded as 1 and 0 if mammography screening was more than 12 months prior.

**Independent variables.** The primary independent variable of interest was whether a woman had a family history of cancer. Two groups were defined: 1) those with a family history of any cancer in a first-degree relative (i.e., cancer history of a woman's mother, father, sons, daughters, brothers or sisters) (n=588); and 2) those without a family history of any cancer (n=943). If a woman acknowledged a history of cancer in any of these relatives, she was classified into the family history of cancer group, otherwise they were classified into the no family history of cancer group.

The following variables were assessed as sociodemographic characteristics: age, income, education, marital status, urbanicity, region, health insurance and smoking. The age variable was defined by the following categories: 40–49 years of age, 50–64 years of age and  $\geq 65$  years of age. The income variable was constructed based on the ratio of family income to poverty threshold reported in the family-level data file of the survey. The levels of the income variables include <100% federal poverty level, 100–199% federal poverty level, and  $\geq 200\%$  federal poverty level. The urbanicity of a participant was determined by using the following U.S. Census Bureau classifications—large metropolitan statistical area (MSA) = population of  $\geq 2,500,000$ , medium high MSA = 2,499,999–1,000,000, medium low = 999,999–250,000 and small MSA = <250,000. The geographical region of the country in which the African-American women were located and defined as follows: northwest, midwest, south and west. Health insurance was classified as “private” if  $\geq 1$  of the health insurance sources available to a woman was private, “public” if participant had Medicaid and/or

Medicare, and “no insurance” if the individual self-identified as such. Education self-reported and categorized by less than high-school education, high-school education and more than high-school education. Marital status was measured by the follow categories: married, separated/divorced/widow and never married/single. The smoking variable was defined as follows: smoker, former smoker and never smoked.

## Statistical Analysis

Descriptive statistics were computed for sociodemographic variables, family history of cancer, mammogram recent and mammogram ever variables. The association of a family history of cancer with sociodemographic characteristics was analyzed for potential interaction terms to include in the subsequent multivariate analysis. This was done using the Chocran-Mantel-Haensel (CMH) test of association and the Chi-squared tests of independence by implementing the CROSSTAB procedure in SUDAAN.<sup>24</sup> These tests were performed for bivariate associations between sociodemographic variables and each mammography group (ever versus recent).

Multivariate logistic regression models were used to assess the effect of family history of any cancer and selected sociodemographic factors on the likelihood of screening. The logistic regression models predicting mammogram ever and mammogram recent were used to obtain odds ratios adjusted for sociodemographic characteristics. Variables controlling for the oversampling of women with no family history of cancer and variables related to nonresponse were included in the model.

## RESULTS

The mean age for the entire study sample (N=1531) was 56.5 years, with a standard deviation of 12.9. For African-American women with family history of cancer, the mean age was 55.6 (with a standard deviation of 12.7), while that for African-American women with no family history of cancer was 57.9 (with a standard deviation of 13.1). Poverty levels and educational status

**Table 3. Bivariate analyses of ever having a mammogram and having a recent mammogram variables**

	<b>P Value for Recent Mammogram (Chocran-Mantel-Haensel Tests)</b>	<b>P Value for Ever Having a Mammogram (Chocran-Mantel- Haensel Tests)</b>
Age	0.05	0.0004
Income, % poverty	0.9409	0.4017
Education	0.0001	0.0054
Marital status	0.001	0.0796
Urbanicity (MSA)	0.4743	0.5285
Region	0.9806	0.6595
Health insurance type	<0.0001	0.0005
Smoking status	0.1501	0.0169
Family history of cancer	0.0003	<0.0001

of women in both categories were similar. At least 90% of women sampled in both categories had income levels of <100% federal poverty level. Sixty-two percent of the women in the study were high-school graduates. However, among women with a family history of cancer, 31% had not graduated from high school (32% for the women with no family history of cancer), while 46% had graduated from high school (43% for women with no family history of cancer). Table 1 shows further details on the sample's sociodemographic characteristics as well as other variables used in the analyses, while Table 2 shows the age-adjusted rates of mammography use.

Results of the CMH test and the Chi-squared test of independence were practically identical such that only the CMH results are reported here. Bivariate associations between family cancer history and the covariates influencing whether a woman had a mammogram recently or not (age, marital status, region and insurance type) were found to be statistically significant at

the 5% significance level. Smoking status was only significant at the 10% level. The remaining variables were not statistically significant. The results suggest possible interaction effects between the significant covariates and family cancer history.

The family cancer history and mammogram recent variables were also tested for bivariate association and found to be positively and highly correlated (p=0.0003 for both the CMH test and Chi-squared tests). Similar tests were conducted for the mammogram ever variable, yielding similar results. Both the CMH test and Chi-squared test of independence showed a high degree of positive association between family history of cancer and mammogram ever (p<0.001). Most women with a family history of cancer had ever had a mammogram.

Additionally, tests of bivariate association were performed for all sociodemographic characteristics against mammogram ever and mammogram recent variables. Age, education, marital status, health insurance type and

**Table 4. Multivariate associations between social determinants and breast cancer screening service use**

Independent Variables and Effects	Mammogram Recent Odds Ratio (95% CI)	Mammogram Ever Odds Ratio (95% CI)
Intercept	1.29 (0.37–4.56)	3.54 (1.12–11.20)
Age Category (ref: ≥65 years)		
40–49	0.66 (0.43–1.01)	0.74 (0.49–1.11)
50–64	0.95 (0.67–1.33)	1.42 (0.86–2.33)
Family History of Cancer (ref: without family history of cancer)		
With family history of cancer	1.39 (1.06–1.81)*	2.41 (1.76–3.29)***
Insurance Type (ref: private insurance)		
Public	0.51 (0.35–0.74)***	1.02 (0.68–1.51)
No insurance	0.30 (0.21–0.44)***	0.51 (0.33–0.80)*
Marital Status (ref: married)		
Widowed/separated/divorced	0.90 (0.69–1.19)	1.12 (0.81–1.54)
Never married	0.67 (0.47–0.95)*	0.88 (0.58–1.32)
Education Level (ref: less than high school)		
High-school graduate	1.49 (1.09–2.04)*	1.42 (0.99–2.04)
Higher than high-school graduate	1.51 (1.06–2.14)*	2.03 (1.26–3.26)*
Poverty Level—Household Income Indicator (ref: ≥200% FPL)		
100–199%	0.89 (0.27–2.95)	0.96 (0.39–2.37)
≥200%	0.98 (0.30–3.17)	0.69 (0.23–2.07)
Urbanicity—MSA (ref: ≥2,500,000)		
2,499,999–1,000,000	1.17 (0.82–1.67)	1.27 (0.84–1.91)
999,999–250,000	1.13 (0.82–1.56)	1.13 (0.71–1.78)
<250,000	1.04 (0.73–1.50)	0.94 (0.59–1.50)
Region (ref: northeast)		
Midwest	0.84 (0.55–1.30)	0.78 (0.50–1.22)
South	1.02 (0.68–1.54)	0.79 (0.52–1.18)
West	0.81 (0.5–1.30)	0.68 (0.39–1.20)
Smoking Status (ref: former smoker)		
Current smoker	0.84 (0.54–1.29)	0.63 (0.38–1.05)
Never a smoker	1.00 (0.71–1.41)	0.69 (0.44–1.08)

\* p<0.05, significant; \*\* p<0.01, highly significant; \*\*\* p<0.001, very highly significant; CI: Confidence interval

family history of cancer had significant associations with the mammogram recent variable at the 5% significance level. Similarly, age, education, health insurance type, smoking status and family history of cancer were all significantly associated with the mammogram ever variable at the 5% significance level. Age was positively associated with mammography use and, as shown in Table 2, the 50–64-year age category recorded the highest rate of mammography use. Education was also positively associated with mammography use; women with a higher educational level had higher rates of mammography use both recently and ever. Similar associations were established for the marital status with married women recording higher rates of mammography use. Regarding health insurance type, women with private health insurance recorded the highest rates of mammography use, while those without health insurance recorded the lowest.

Table 3 shows the p values for these tests. These results lend statistical rationale for including the significant variables as covariates in the multivariate analysis that followed.

Table 4 contains the results of the multivariate logistic regression models built to assess the simultaneous effect of family history of cancer and other factors on the likelihood of having mammography screening. Controlling for sociodemographic factors, health insurance type and smoking status, a significant and positive effect of family history of cancer on the likelihood of mammography screening ever was established ( $p < 0.001$ ). African-American women who reported a history of family cancer were 41% more likely to have ever had a mammography screening compared to women without a history of family cancer. Similarly, a significant positive effect of family history of cancer on the likelihood of mammography screening in the past year was established; African-American women who reported having a history of any cancer in their immediate family were 39% more likely to have had a recent mammogram than those without a family history of cancer ( $p < 0.05$ ).

When age groups were compared, women aged 40–49 years were more likely to have had mammography screening than women age  $\geq 65$ . Women aged 50–64 years were even more likely to have had a mammography screening ever and within the past year compared to women in the  $\geq 65$ -year age group.

There were significant differences found for the types of health insurance the women had. Women with private insurance were significantly more likely to have had a mammogram (ever and recent) compared to women with no insurance or with public health insurance. Women with public health insurance were more likely to have had a mammogram (ever and recent) compared to those who did not have any health insurance but were 49% less likely to have had a recent mammogram when compared to those that had private health insurance.

Positive associations with mammography screening

were also found with education and marital status. Women with education less than high school were less likely to have mammography screening (ever or recently) compared to women with higher than a high-school diploma. Women who never married were 23% less likely to have had a recent mammogram compared to those who were married and 33% less likely to have had a recent mammogram compared to those who were married.

Additional analysis was performed to explore the presence of interaction effects between family history of cancer with age, marital status, region and health insurance type. This analysis yielded no significant results; hence, only the model without interaction terms is reported in Table 4.

## DISCUSSION

This study represents a unique contribution to existing research through its inclusion of family history of any cancer as a potential predictor of mammography screening behaviors in asymptomatic African-American women. Our findings demonstrate a significant correlation between family history of any cancer and breast cancer screening practices among African-American women. This correlation was significant for those reporting to ever have a mammogram across all age groups  $\geq 40$  years. In other words, when African-American women age  $\geq 40$  know that an immediate family member (i.e., parent, sibling or child) has had cancer, they are more likely to get mammography screening. This association continued to be significant after adjustment for known demographic predictors of mammography screening behavior such as health insurance type and risk factor (smoking status).

Our findings have important implications for providers, particularly those that treat cancer patients. First, knowing that African-American women who are eligible to receive mammograms are motivated to get screened when they have a close relative with breast cancer would suggest that providers should engage the spouses, mothers, daughters and sisters of their cancer patients. The timing of having a close family member diagnosed with cancer presents a unique teachable moment to talk about general cancer prevention. It is interesting that women were motivated regardless of the family member that had cancer, suggesting that having a close experience with cancer in and of itself makes women more aware of cancer overall. Thus, it is not necessary that discussion be linked to genetic or familial risk for cancer. Instead, when providers are treating cancer patients, they can use interactions with female relatives of their patients to distribute or share prevention information. Given that when a close family member (child, sibling, child) is diagnosed with cancer the immediate family is often engaged in appointments or aspects of treatment, giving messages about screening mammograms can be an easily integrated to provide a family approach to care.

Although our study did not specifically focus on African-American women's perceived susceptibility of risk, other studies have made the connection between familial cancer history (particularly breast cancer) and mammography screening.<sup>14,25-30</sup> Nevertheless, our study confirms the work of Royal-Schaler and her colleagues which indicates that accurate knowledge of breast cancer risk, particularly the role of the family, impacts a woman's screening practices. We hypothesized that women's knowledge of having a family member with any cancer and the fact that women with this knowledge were more motivated to get screened were an indication of a woman's perception of her risk. On the other hand, the results of our study differ from that of Smith West et al., who found that neither the knowledge of a familial cancer history nor a perceived relative risk of breast cancer was associated with either increased or decreased early detection practices among rural African-American women.

Data were not available through the NHIS 2000 Cancer Module that explicitly addressed the issue of early detection or perceived risks. Because this study excluded women who had a cancer diagnosis, a key assumption was that screening in our sample constituted a preventive behavior. Although the NHIS does not ask women if they perceive a family history of cancer as a risk factor, we tested this assumption by empirically examining the correlation between family history of any cancer and screening behavior. It was not in the scope of this study to look at the history of cancer in a female's lineage or the site because the NHIS data set is limited to immediate family members and does not include, for example, grandmothers or aunts. Thus, further investigation is warranted to examine the extended family's influences on African-American women and mammography screening.

It is unclear if public health promotion campaigns promoting mammography screening are serving as a new catalyst to remind and influence women to get screened. Our study demonstrates that family history of any cancer is a significant predictor of screening behavior among asymptomatic African-American women. Future research will examine the role of family history versus provider recommendations as well as family history of site-specific cancers as predictors of breast cancer screening in this population. NHIS, however, is limited in examining the health promotion trends in mammography screening for African-American women.

This study affirms that African-American women are overcoming barriers to screening due to cost or insurance. The majority of the women sampled (>80%) had some type of health insurance coverage. During the time of this study, various public health screening initiatives, which were extensively promoted, were made available to reach underserved women regardless of their insurance status. Notably among these were the National Breast and Cervical Cancer Early Detection Control Program (administered and funded through the CDC), which availed funds

for screening, diagnostic and follow-up services for medically underserved women.<sup>6</sup> In this study, women with insurance were much more likely to receive mammography screening than the women without any insurance coverage. Presumably, women without insurance coverage would be eligible for the CDC-sponsored screening program; however, other barriers, such as transportation or knowledge about the program, might have been prohibitive for them. Also, this study confirms that women without health insurance are underutilizing the low- and no-cost screening programs, which is consistent with national findings reporting that only 15% of the eligible women are being screened by the National Breast and Cervical Cancer Early Detection Control Program.<sup>13</sup> This raises a challenge for health policymakers and health educators to identify other motivators for recruitment of women without insurance coverage into such programs. Using a family-centered approach versus a more individual approach holds promise for increased participation of African-American women in mammography screening.

The lack of knowledge regarding breast cancer prevention, screening guidelines and benefits of mammography has been widely cited as a barrier contributing to the mortality disparity that exists between African-American and Caucasian women.<sup>31-38</sup> However, this study reveals that women with knowledge of a family history of cancer appear to be overcoming previously identified barriers to screening.

Studies show that women make decisions regarding their health in context of family responsibilities.<sup>39-42</sup> For African-American women in particular their decision-making practices related to mammography screening are in harmony with their life experiences.<sup>43</sup> McAdoo<sup>44</sup> asserted that, for African-American families, decisions that impact the entire family are made with the family. We conclude this study by challenging researchers that design interventions to address the risks of African-American women and breast cancer to expand investigations to include African-American women's decision-making practices.

As researchers ponder innovative approaches to increase prevention and early screening practices for African-American women, the family will need to be part of the paradigm. This may have implications for participation in emerging cancer screening and prevention modalities in the near future. As African-American women become more comfortable in discussing cancer with their family and as they increase their knowledge of their individual and familial risks of cancer, they may be more likely to respond to recruiting efforts for prevention practices such as chemoprevention and genetic testing. This may eventually eliminate the disparity in breast cancer mortality rates of African-American women and Caucasian women.

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