

# THE EFFECT OF A CHURCH-BASED BREAST CANCER SCREENING EDUCATION PROGRAM ON MAMMOGRAPHY RATES AMONG AFRICAN-AMERICAN WOMEN

Baqar A. Husaini, PhD, Darren E. Sherkat, PhD, Robert Levine, MD, Richard Bragg, PhD,  
Van A. Cain, MA, Janice S. Emerson, BS, and Christina M. Mentis, MS

Nashville, Tennessee

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This study examines the effectiveness of breast cancer screening education programs on mammography rates among African-American women 40 years of age and over. We conducted two types of educational programs in community settings, primarily in African-American churches. Three-month follow-up interviews were used to determine whether women who participated in programming were more likely to get a mammogram if they had not had a mammogram in the last year. Our results demonstrate that the educational programs significantly increased the likelihood of getting a mammogram when compared to a control group that received no educational programming. Further, we found that the programs were effective for motivating breast cancer screening in housing projects as well as in the churches, and that the effectiveness of the programs remained even when we controlled for socioeconomic status, depression, and age. (*J Natl Med Assoc.* 2002;94:100-106.)

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**Key words:** mammography ♦ African American ♦ cancer screening ♦ church-based

Health care education holds considerable promise to reduce health disparities across ra-

cial and ethnic groups, and social classes—a key goal of public health directives in the United States. By increasing knowledge of and access to preventive care and disease screening, morbidity and mortality differentials can be reduced. Breast cancer screening is a principal target for these educational efforts, given the importance of early detection for successful treatment of breast cancer. Mounting literature on race differentials in breast cancer mortality rates has demonstrated that although rates of breast cancer do not differ across racial groups (and may even be lower among African Americans), mortality rates are substantially higher for African-American women.<sup>1,2</sup> There is strong evidence that differences in breast cancer screening rates contribute to higher mortality rates among African Americans. Clearly, more needs to be done to promote breast cancer

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© 2002. From the Center for Health Research, Tennessee State University, Nashville, Tennessee; Department of Sociology, Southern Illinois University, Carbondale, Illinois; Department of Preventive Medicine, Maharry Medical College, Nashville, Tennessee; and the Centers for Medicare and Medicaid Services, Washington, DC. Presented at the first National HBCU Health Care Services Research Network Conference at New Orleans, Louisiana.

Research was supported by grants from the Health Care Financing Administration (HCFA 20P-90889), National Institute of Health [NIH (MBRS) 2S06GM08092-24], and the National Institute of Mental Health (NIMH-R24MH59748-01) to Tennessee State University, Baqar A. Husaini, Principal Investigator. Requests for reprints should be addressed to Dr. Husaini, Box 9580, Center for Health Research, Tennessee State University, Nashville, TN 37209.

screening in minority populations, and alternative educational programs need to be introduced to tailor information to the unique cultural and economic circumstances that these women face.<sup>3</sup> In this study, we describe such an alternative program and discuss its effectiveness for motivating breast cancer screening among African-American women 40 years of age and over.

## RACE, BREAST CANCER SCREENING, AND HEALTH EDUCATION

Breast cancer is a particularly important indicator of racial health disparities because it is the second most common form of cancer among women, has the second highest cancer mortality rate among women, and rates of survival can be dramatically improved through early detection.<sup>4</sup> Studies have shown that early detection can reduce breast cancer mortality by 34% in women over 50 years of age.<sup>5</sup> Further, some studies indicate that the incidence of breast cancer is actually lower among African Americans than among whites, 99 per 100,000 for African-American women compared with 113 per 100,000 for white women.<sup>6</sup> Despite this, African-American women have 34% higher breast cancer mortality rates than do whites,<sup>4</sup> and they have substantially lower 5-year survival rates once diagnosed, 64% compared with 81% for whites.<sup>2</sup>

One key finding of previous research that helps make sense of African Americans' higher mortality rates and lower survival rates is that breast cancer screening is less prevalent in minority populations.<sup>3,7</sup> Without early detection, survival rates decline substantially and this contributes strongly to higher overall mortality rates. Recognizing this, public health researchers have begun investigating a variety of health education programs to increase breast cancer screening among minority women. Some programs have used simple prompting with health information geared to sharpen health beliefs and promote health conscious behaviors,<sup>5</sup> or they have used clinical workers to contact

women individually.<sup>8</sup> However, the relative ineffectiveness of some of these efforts has led researchers to investigate other measures for promoting breast cancer screening.

African-American communities are aptly characterized by a density of social ties through friendship, kinship, occupation, religion, and residence.<sup>9</sup> The legacy of segregation and discrimination concentrates African-American families in particular neighborhoods, restricts their association with others, and limits occupational and educational opportunities. Yet, these neighborhoods also generate considerable indigenous social capital through voluntary organizations and especially the churches.<sup>10</sup> Some of the most promising recent efforts to enhance breast cancer screening among African Americans have focused on the use of lay leadership in health education to promote breast cancer screening.<sup>11-14</sup> Studies have also investigated how church-based programming, and integrating educational programs with existing social support networks and community characteristics, might facilitate health-related behaviors.<sup>2,7,12,15</sup>

With these investigations in mind, our study examines the effectiveness of two types of community-based health education programs directed at increasing breast cancer screening among older African-American women. Our research focuses mostly on church-based educational programming, however, we also examine the effectiveness of these community-based outreach efforts in public housing projects. Although church-based programming can be expected to be quite effective,<sup>16</sup> researchers and public health officials must also be sensitive to the fact that although African Americans remain more religious than white Americans, substantial and growing proportions of African Americans are not connected to religious institutions.<sup>17</sup> Our programs differ from those implemented in other studies in that we generate a group-level educational program that uses preexisting community resources that may help generate a social context supportive of breast cancer screening.

## THE EDUCATIONAL PROGRAM

This study used a three-group, quasi-experimental design to test the effectiveness of two levels of educational programming compared to a control group.

- 1) The “full program” used two video presentations, a question and answer session, and trained personnel from the Center for Health Research at Tennessee State University to teach women about breast self-examination, breast cancer risk, screening, and health care availability.
- 2) The “partial program” used only videos to communicate the information. Comparing these two groups will give some indication of the relative need for direct professional guidance for health education.
- 3) A control group received no educational programming until after the second wave of data were collected. At that time, the control group viewed the videos in their homes—essentially making them comparable to the partial program group.

The videos that were used in both the full and partial programs were targeted toward African-American women. The first video was produced by Glaxo Wellcome Health Education and has a focus on African-American women over 40 years of age. The second video was produced by Aquarius Productions, and concentrates on breast cancer education for African-American women over age 60. Both videos discussed the importance of the early detection of breast cancer for facilitating a cure. They also emphasized the role of mammography in early detection and breast cancer prevention. Each addresses common myths about breast cancer and breast cancer screening. Additionally, the videos contained demonstrations of breast self-examination. All of this information was conveyed with an emphasis on the importance of breast cancer prevention for African-American women, providing culturally

relevant instruction in preventive behaviors. Together, the two videos were approximately 40 minutes.

In the full program, a trained community worker reinforced the messages presented in the videos. Additionally, the instructor used models of breasts developed by Health Edco that contained various sized and shaped lumps to demonstrate what breast cancer might feel like. The model also included a Concern Breast vest model for breast self-examination demonstrations that was placed on full program participants so they could feel for lumps in the model when it was strapped to their body. The community worker also taught women the proper technique of breast self-examination and discussed preventive health options that were available to them. The clinical instruction took approximately one hour to conduct, hence the full program lasted approximately one and one-half hours. In contrast, the partial program took approximately 50 minutes to administer.

By providing culturally relevant information and instruction in a group setting, the program aimed to reinforce positive health behaviors in community settings. Isolated individuals may become overwhelmed with details of information, become bored with a presentation, or find it less salient and meaningful. However, group context provided models for behavior, since many friends or relatives in the church or community would affirm the importance of screening and testify about their own positive experiences with preventive behaviors. Further, friends and relatives in congregations will generate positive regard for those who engage in healthy behaviors, and may induce members who have not been screened to seek a mammogram.

Additionally, each woman in the full and partial program group was given a set of breast cancer education materials from the American Cancer Society (a bookmark, shower hanger, and three pamphlets on mammography, breast self-examination, and breast cancer), and from the African American Breast Cancer Alliance

(two pamphlets). The pamphlets from the African American Breast Cancer Alliance focused on mammography and why it was important for African-American women. They also stress the need for early detection and discuss fears and problems that lead African-American women to have higher rates of breast cancer mortality. We also included a refrigerator magnet to remind women to perform breast self-examination once a month, and added two other shower-hanging reminders (one from the Tennessee Department of Health and the other produced by Vanderbilt Cancer Center) with explicit instructions on how to perform breast self-examination. The materials also reminded women of the need to get a mammogram once a year.

The rationale for using a 'partial program' in the design was simple; that is, if the partial program worked as effectively as the full program, this might provide a lower-cost alternative to fully staffed health education programs. Although the full program gave women additional opportunities for learning about breast cancer, and a very clear hands-on demonstration of breast self-examination, this level of outsider involvement may not be necessary. After the second wave of data collection, the control group viewed the two videos in their own homes or at the Center for Health Research, and they were also given the various educational materials. We did not inquire whether the respondents were ever diagnosed with breast cancer.

## SAMPLE AND PROCEDURES

We recruited African-American women age 40 and over, primarily from African-American churches in the Metropolitan Nashville, Tennessee area. Because our educational program required group participation, and the cooperation of churches and other community organizations, we: (1) worked with the NAACP's Health Committee to identify and help support recruiting churches; (2) met with the Interdenominational Fellowship of African-American ministers; (3) sent letters to 56 randomly se-

lected churches informing them about the project and requesting their participation; (4) gave presentations to church boards to help recruit participants; (5) all participants received a total of \$40.00 in grocery gift certificates to thank them for their participation; \$20 at baseline, and \$10 for each follow-up interview. We were able to give program presentations at 30 African-American churches and 2 housing projects. We also recruited participants at a health fair at a historically African-American university. A total of 364 African-American women volunteered to participate in our intervention programs.

Participants were interviewed before any programming was conducted, then follow-up interviews were conducted 3 months later (a 6-month follow-up is currently being collected). Program participants came exclusively from the churches and housing projects, because the programming was group focused. In general, churches that had less than 10 volunteers did not get the program, and participants from those churches became part of the control group. In the end, 256 women went through the full program. Thirty-five of the full program participants were recruited from the housing projects, whereas the remainder came from the churches. Partial program participants ( $n = 49$ ) were recruited exclusively from the churches. In the control group ( $n = 59$ ), 19 participants were recruited from the health fair, whereas the rest came from churches.

## MEASURES

Our key-dependent variable is *mammogram status*, which has three categories: (1) a mammogram was obtained in the last year; (2) a mammogram was obtained between wave 1 and wave 2 data collection; and (3) a mammogram was needed but not obtained. The three sample groups (full program, partial program, and control) are compared using analysis of variance and predicted probabilities from multinomial logistic regression models.

We control for several factors that are pre-

**Table 1. Sample Comparisons on Key Variables**

	Full program	Partial program	Control
Age	56.1	56.2	51.2+*
Monthly income (1 = < \$500, thru 8 = > \$2000)	5.1	5.0	6.3+*
Education	13.4	11.9+	14.4+*
CESD	9.9	10.2	8.0*
Housing projects	0.13	0	
Mammogram in the last year	0.67	0.70	0.63
Ever had a mammogram	0.88	0.90	0.92
Mammogram between T1 and T2	0.36	0.45	0.24*

+ = Mean difference from full program is significant at the 0.05 level, two-tailed.  
\* = Mean difference from partial program is significant at the 0.05 level, two-tailed.

dictive of breast cancer screening: age; monthly income (measured from 1 = <\$500 per month to 8 = >\$2000 per month); years of education; and a Center for Epidemiologic Studies Depression (CESD) scale score (see Radloff<sup>18</sup>). Higher scores on the CESD scale reflects presence of depression as experienced in the last week. In the multinomial logistic regression models, we constructed a z-score index for education and income to measure socioeconomic status.

## RESULTS

### Demographic Factors and Mammography

Given the nature of the sampling procedures, it is useful to first compare the three groups on key indicators. Table 1 presents the unadjusted means on dependent and independent variables for each of the three sample groups. Participants in the control group are significantly younger, and have higher incomes and educational levels than those in the two program groups. This is to be expected given that a substantial plurality of the control group was recruited from a university health fair, whereas many full program participants were recruited in housing projects. The two program groups did not differ significantly from one another on any key variables with the ex-

ception of education—where partial program participants lag behind full program participants. Below, we will compare the effectiveness of the program for motivating breast cancer screening while controlling for age, depression, and socioeconomic status.

Importantly, the three groups did not differ significantly in their initial rates of breast cancer screening. Hence, our convenience samples did not tend to select women with more health conscious behaviors into the program groups. If anything, our sampling procedures may have garnered a control group that is particularly prone to practicing positive health behaviors. Table 1 also shows that the control group was significantly less likely to receive an updated mammogram between wave 1 and wave 2 of the study.

Table 2 presents the means for key independent variables by mammogram status. We find that women who had mammograms within the last year were significantly older and had fewer depressive symptoms than women who failed to get a mammogram in the year prior to the study. Women who were recruited from the housing projects were overly represented among those who did not have timely breast cancer screening. Further, women who did not receive the program information were less likely to have obtained a mammogram.

### Effect of Program on Mammography

Table 3 compares the mammogram status of four groups: no program, full program, partial program, and full program in the housing projects. To assess the effectiveness of the health education programs, we focus here on women who did not have a mammogram in the previous year—because other women do not require screening under current protocols. In Table 3, we present the unadjusted percentages, as well as percentages adjusted for age, socioeconomic status (SES), and depression (calculated as predicted percentages from a multinomial logistic regression model).

We found that only 45% of the control group obtained mammograms between wave 1 and

**Table 2. Mean Comparisons of Mammogram Status and Predictor Variables**

	Mammogram in the last year	Mammogram T1-T2	No mammogram
Age	57.1	55.9	51.6+*
CESD	8.8	7.7	12.9+*
Monthly income (1 = <\$500, thru 8 = >\$2000)	5.4	5.2	5.3
Education	13.3	13.7	13.2
Projects	.05	.08	.19+*
Full program	.71	.72	.69
Partial program	.11	.17	.08
No program	.18	.11	.22*

+ = Mean difference from last year mammogram status is significant at th 0.05 level, two-tailed.

\* = Mean difference from T1-T2 mammogram is significant at the 0.05 level, two-tailed.

wave 2, whereas 64% of the full program participants and 79% of partial program participants were screened for breast cancer. The difference between both program groups and the control group is statistically significant (although the two program groups do not differ significantly from one another). As might be expected, full program participants from the housing projects lagged significantly behind other program participants. However, we do note that these underserved program participants obtained mammograms at almost the same rate as the relatively privileged control group.

**Table 3. Percent of Subjects Obtaining Breast Cancer Screening Between Wave 1 and Wave 2 by Program, and Predicted Percentage from Multinomial Logistic Regression Model Controlling for Depression, SES, and Age**

	Observed percentage	Predicted percentage
No program participation	45.2%*†	48.9%*†
Full program participation	63.9%‡§	69.7%‡
Partial program participation	78.6%‡§	80.3%‡
Full program in projects	44.0%*†	58.2%

‡ = Difference from no program significant at 0.05 level, two-tailed.

\* = Difference from full program significant at 0.05 level, two-tailed.

† = Difference from partial program significant at 0.05 level, two-tailed.

§ = Difference from full program in projects significant at 0.05 level, two-tailed.

The effectiveness of the program remains significant even when controls for depression, SES, and age are added. Indeed, when we control for these factors, full program participants in the housing projects are expected to have higher rates of breast cancer screening, negating the significant difference from other program participants. This implies that the difference between housing project program participants and other program participants is largely the result of higher rates of depression and lower SES. Indeed, our predicted percentage for housing project participants is 58%, higher than the 49% predicted for the control group. Although the difference between housing project participants and the control group is not significant, their higher expected percentages testify to the effectiveness of the program even among underserved and less privileged participants.

**DISCUSSION AND IMPLICATIONS**

Our findings show that our educational interventions increased rates of breast cancer screening significantly when compared to a control group who received no health education materials during this period. Further, this difference held even although the control group was largely comprised of women who were interested in health issues, having been recruited from a health fair at a university. Importantly, the partial program was found to be as effective as the full

program for motivating breast cancer screening. Further data collection and evaluation are needed, but it appears that the more cost-effective group-based programs are just as efficacious for promoting breast cancer screening through African-American churches. Formal instruction in breast cancer education by trained personnel does not seem to increase the effectiveness of the program. Collective viewing of the videos was sufficient for motivating women to obtain mammograms if they did not have up-to-date screening.

Also of note, our study shows that programming was effective for motivating breast cancer screening even among those who live in public housing projects. Residential communities, even low-income housing projects, situate women in social networks, and these social ties can help motivate positive health-related behaviors. Again, more research is needed to evaluate this result, however our initial investigation holds considerable promise for these health education programs, even when implemented in contexts in which initial screening rates are low.

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