

# Collaborative Breast Health Intervention for African American Women of Lower Socioeconomic Status

Barbara A. Fowler, DNSc, APRN, BC, Marilyn Rodney, MS, RN,  
Sandra Roberts, and Linda Broadus

**Purpose/Objectives:** To describe all phases of a collaborative breast health intervention delivered by paraprofessionals or specially trained community health advisors (CHAs) for African American women designed to increase mammography screening.

**Design:** Collaborative pretest, post-test breast health intervention.

**Setting:** Large city in Ohio.

**Sample:** 68 African American women with a median age of 57.8 (SD = 5.28) obtained mammography screening and participated in the breast health intervention.

**Methods:** Specially trained CHAs used aggressive recruitment strategies to increase mammography screening and knowledge of breast health and mammography screening in African American women aged 50 and older.

**Main Research Variables:** Knowledge scores of breast health and mammography screening.

**Findings:** Ninety women (81%) met the inclusion criteria and were recruited into the intervention, but only 68 (76%) obtained mammography screening. The women demonstrated increased knowledge by change in pre- to post-test scores. Several questions were statistically significant.

**Conclusions:** Collaborative breast health interventions delivered by trained CHAs are effective in increasing screenings as well as knowledge of breast health and mammography screening in African American women. The unique role of the CHA is especially important in recruitment of hard-to-reach women and was vital to the success of the educational intervention. Most importantly, the women valued the individualized attention to their breast health and agreed to share the information with significant others. Further collaborative interventions designed to increase screenings and increase knowledge of breast health and mammography screening are needed to reduce the health disparities of later-stage detection and poorer survival of breast cancer in African American women.

**Implications for Nursing:** Oncology nurses should build on the findings and deliver further outreach programs to increase mammography screening and knowledge of breast health in a larger number of women of lower socioeconomic status. Future research is needed to determine the influence of reminder phone calls for mammography screening. Oncology nurses should incorporate evaluation strategies at baseline and periodically throughout an intervention to provide more comprehensive data and enhance the credibility of findings. To maximize success, oncology nurses should work collaboratively with other healthcare professionals such as certified x-ray technicians and influential people in the community to increase knowledge of breast health and mammography screening.

Scientific evidence has confirmed that mammography screening is the “gold standard,” or most efficacious method, for early detection of breast cancer in women aged 50 or older regardless of racial or ethnic group or socioeconomic status (SES) (National Cancer Institute, 2004; Ward et al., 2004). Yet African American women lag behind non-Hispanic, Caucasian women (68% versus 72%) in

## Key Points . . .

- Specially trained community health advisors are effective in increasing mammography screening and knowledge of breast health in African American women older than 50 and of lower socioeconomic status.
- Targeted community programs can have spillover effects increasing awareness of breast health and mammography screening because former participants, interested women, and representatives from community agencies requesting services.
- Oncology nurses should work collaboratively with other healthcare professionals and influential people in the community to increase program success.

mammography screening (Ward et al.). The findings were confirmed in an epidemiologic report from the National Center for Health Statistics (NCHS, 2001) (52% versus 57%). The disparities are greater when SES is considered. One example is evident from 10-year tracking data from the National Breast and Cervical Cancer Early Detection Program (NBCCEDP), which provides free or no-cost mammography screening and follow-up breast health services for women who are unemployed or employed in minimal-wage jobs without health insurance coverage. The findings showed that African American women compared to non-Hispanic, Caucasian women obtained significantly fewer mammography screenings (17% versus 60%) (Centers for Disease Control and Prevention [CDC], 2003). The gap in mammography screening is illustrated further in more age-adjusted, premature deaths from breast cancer in African American women compared to non-Hispanic, Caucasian women (37% versus 28% per 100,000) (Ward et al.). In addition, African American women compared to non-Hispanic, Caucasian women

*Barbara A. Fowler, DNSc, APRN, BC, is a professor of nursing in the College of Nursing and Health at Wright State University in Dayton, OH; Marilyn Rodney, MS, RN, is the service learning coordinator at Sinclair Community College and the former director of the Community Health Advisors (CHAs) program in the Center for Healthy Communities in Dayton; and Sandra Roberts and Linda Broadus were CHAs in the collaborative breast health intervention. (Submitted May 2004. Accepted for publication February 17, 2005.)*

Digital Object Identifier: 10.1188/05.ONF.1207-1216

experience higher rates of regional (36% versus 29%) and distant (9% versus 5%) stages of breast cancer at time of diagnosis, resulting in lower relative five-year survival rates (73% versus 88%) (Ward et al.). Because of the differences, researchers and healthcare professionals have deemed the issue a major priority.

Mammography screening of African American women (pooled data from groups of different SES) in the state of Ohio mirrors national data (65% versus 68%) (CDC, 2004). Lower screening rates also have been reported in two inner-city communities, characterized as the poorest neighborhoods in Montgomery County, compared to other counties in the state of Ohio (Combined Health District of Montgomery County, 2004). This is not surprising, given the fact that both inner-city communities have a profile of residents receiving healthcare services on an as-needed basis (Wright State University College of Nursing and Health, 2001). Almost all of the residents are African American (90% and 93%), with 60% achieving a high school education or less. About 65% of women aged 50 or older reside in single-parent households and are dependent on public assistance such as Medicaid or work in part-time or minimal-wage jobs. Healthcare professionals at two public health clinics, serving the majority of residents in the inner-city communities, categorized the women as "hard to reach" because they came to the clinics sporadically.

The purpose of this article is to describe all phases of a collaborative breast health intervention delivered by paraprofessionals or specially trained community health advisors (CHAs). The specific aims were (a) to increase mammography screening through the NBCCEDP in about 100 African American women aged 50 or older in two inner-city communities in Montgomery County; (b) to deliver a 30-minute educational intervention on breast health and mammography screening for African American women; (c) to determine before-and-after differences in knowledge scores of breast health and mammography screening; and (d) to determine the effectiveness of the intervention. The intervention is consistent with recommendations from "Healthy People 2010" (U.S. Department of Health and Human Services Public Health Service, 2000), which supports collaborative interventions to increase knowledge of breast health and mammography screening in women of lower SES.

## Background and Literature Review

During the past two decades, a dramatic increase has occurred in the number of studies examining lower mammography screening in African American women. The study findings are organized into four categories: (a) lower SES (education and income, literacy issues, and lack of health insurance coverage); (b) beliefs of decreased personal control over health decision making, beliefs regarding susceptibility to breast cancer, and system or structural barriers to mammography screening such as costs, location, and convenience of services; (c) fears and fatalistic beliefs; and (d) cultural and religious beliefs and prior negative experiences with healthcare professionals and systems.

### Lower Socioeconomic Status, Literacy Issues, and Lack of Health Insurance Coverage

A consistent finding in the empirical literature was that lower SES factors and literacy issues (e.g., lower reading

scores) were related to decreased mammography screening in African American women in studies conducted by Champion and Scott (1997); Davis et al. (1996); Facione, Miaskowski, Dodd, and Paul (2002); McDonald, Thorne, Pearson, and Adams-Campbell (1999); Mickey, Durski, Worden, & Danigelis (1995); and Williams (1998). Burnett, Steakley, and Tefft (1995); Fowler (2003); and Miller and Champion (1997) found that higher income was associated with having mammography screening and adherence. In a study by Price, Desmond, Slenker, Smith, and Stewart (1992), African American women aged 35–75 were uncertain whether smoking, taking oral contraceptives, a bump in the breast, poor diet, drinking too much alcohol, stress, or rough handling of the breast resulted in breast cancer. Other researchers found that lack of health insurance coverage was associated with decreased mammography screening in African American women particularly (Freeman, Muth, & Kerner, 1995; McCarthy et al., 1998; Mickey et al.; Pearlman et al., 1997; Thompson, Montano, Mahloch, Mullen, & Taylor, 1996). In Rojas, Mandelblatt, Cagney, Kerner, and Freeman's (1996) study, African American women were reluctant to follow up with healthcare professionals' recommendations for abnormal mammography screening because of potential lost wages.

### Beliefs Regarding Personal Control, Susceptibility, and System and Structural Barriers

Several researchers have demonstrated that beliefs of decreased personal control over health decision making and susceptibility of breast cancer resulted in lower mammography screening in African American women (Bibb, 2001; Burns et al., 1996; Champion & Menon, 1997; Danigelis, Worden, & Mickey, 1996; Facione et al., 2002; Makuc, Breen, & Freid, 1999; Mandelblatt & Yabroff, 2000; McCarthy et al., 1998; Miller & Champion, 1997; Roberson, 1997; Rojas et al., 1996; Vellozzi, Romans, & Rothenberg, 1996). In Miller and Hailey's (1993) study, higher cancer anxiety and external health locus of control scores were related to self-report of no prior history of mammography screening in African American women parishioners. The study made no mention of SES. Foxall, Barron, and Houfek (2001) reported almost identical findings in African American women with lower SES. Caplan, Helzlsouer, Shapiro, Wesley, and Edwards (1996), Chang et al. (1996), and Rojas et al. found that longer system delays influenced follow-up tests after abnormal breast cancer screening.

### Fears and Fatalistic Beliefs

A number of researchers have found that fears and fatalistic beliefs of cancer result in lower cancer screening in African Americans (Bowen, Hickman, & Powers, 1997; Dignan, Michelutte, Jones-Lighty, & Bahnson, 1994; Fowler, 2003; Glanz, Resch, Lerman, & Rimer, 1996; Gregg & Curry, 1994; Lannin et al., 1998; Parks, 1998; Phillips, Cohen, & Moses, 1999; Phillips, Cohen, & Tarzian, 2001; Pinn, 1998; Powe, 1995; Powe & Weinrich, 1999; Salazar & de Moor, 1995; Thompson et al., 1996; Williams, 1998). Herskovits (1990) wrote that the relationship between fears and fatalism is exceedingly complex and requires an understanding of culturally imposed interpretation of African Americans. He emphasized that the cultural interpretation is deeply embedded in the historical slavery experience that represented social order, control, violation, and discipline of people in inferior positions. Herskovits postulated that the historical slavery experience has been

perpetuated from generation to generation and, therefore, greatly affects the fears and fatalistic beliefs of African Americans in hierarchical, social organizations that are shaped by a dominant race or class system.

## **Cultural and Religious Beliefs and Prior Negative Experiences With Healthcare Professionals**

Considerable research has shown that cultural and religious beliefs are important determinants in some African American women's decisions to refuse mammography screening. No particular factor or religious orientation has been determined. Researchers believe that a synergistic effect of these factors exists in African American women (Baldwin, 1996; Bibb, 2001; Bobo, Dean, Stovall, Mendez, & Caplan, 1999; Bourjolly, 1998; Champion & Menon, 1997; Facione et al., 2002; Facione & Giancarlo, 1998; Fowler, 2003; Makuc et al., 1999; Miller & Champion, 1997; Parks, 1998; Phillips, Cohen, & Moses, 1999; Phillips et al., 2001; Richardson & Ball-Cook, 1998). Baldwin found that lack of culturally sensitive materials and prior negative experiences with healthcare professionals resulted in decreased mammography screening in African American women. Ashing-Giwa (1999) postulated that learned and endorsed cultural beliefs such as endurance and perseverance have given credibility to some African American women to postpone or ignore recommendations for breast screenings. She concluded that the values might have contributed to a sense of vulnerability and well-being. Conflicting results exist regarding religious beliefs and mammography screening. In Kinney, Emery, Dudley, and Croyle's (2002) study, high scores on the God Locus of Health Control scale predicted lower rates of clinical breast examination and mammography screening in African American women at high risk for breast cancer (odds ratio = 0.88; 95% confidence interval = 0.77–1.00;  $p < 0.05$ ). In contrast, Phillips et al. (2001) found that lower- and middle-income African American women referred to their bodies as the "holy temple of God" and viewed participation in breast cancer screening as an opportunity to keep their bodies healthy.

Research findings consistently have shown that many factors were associated with less use of mammography screening in African American women of lower SES. Based on the findings, researchers recommended further studies such as prospective, longitudinal designs to determine mammography screening patterns over time. Additionally, studies are needed to examine the association of reported health behaviors supporting preventive health screenings of significant others and mammography screening in African American women. Another recommendation was the implementation of collaborative interventions to increase knowledge of breast health and mammography screening and subsequent use in African American women of lower SES.

## **Methods**

### **Development of the Collaborative Breast Health Intervention**

Many factors were considered in the development of the collaborative breast health intervention. Existing community assessment data in two inner-city communities in Montgomery County revealed a population of African American women of lower SES who were 50 and older and used healthcare services at local health departments inconsistently and, there-

fore, would benefit from a breast health intervention. Certified x-ray technicians involved in community outreach for the NBCCEDP reported low enrollment of African American women who qualified for free mammography screening and follow-up breast health services in both communities. With the exception of periodic health fairs, breast health interventions were nonexistent for the women. The data and the success of previous researchers (Altpeter, Earp, Bishop, & Eng, 1999; Earp et al., 2002; Eng & Smith, 1995; Erwin, Spatz, Stotts, & Hollenberg, 1999; Kang, Bloom, & Romano, 1994) using specially trained CHA or paraprofessionals to increase mammography screening provided the basis for the author and other healthcare professionals to implement the breast health intervention in Montgomery County.

The next step involved collaboration with the director of the CHA program to plan the breast health intervention. Montgomery County has a CHA program offered through the Center for Healthy Communities (CHC). The CHC is a partnership agreement among a four-year, state-supported university; a two-year community college; and about 100 health and social service organizations and other community partners to improve the health and well-being of residents in Montgomery County. The CHC supports training and employment for paraprofessionals or CHAs who can bridge the gap in service delivery between healthcare professionals and the community in Montgomery County. The CHC was selected for several reasons. First, it had an existing 10-week educational program for CHAs that offered four academic credits from the community college; second, it has shown success in linking "hard-to-reach" populations across the lifespan with social service and healthcare resources; third, it supported efforts that provided a range of services for residents (CHC, 1997). Another important reason was that other healthcare professionals affiliated with the CHC have supported the CHAs' prior success in fostering collaborative interventions.

After several planning meetings with the director of the CHA program and ongoing communication with certified x-ray technicians involved in breast health outreach services, the primary author applied for and received a \$150,000 population-specific grant from the Susan G. Komen Breast Cancer Foundation to implement the intervention. The funding would be used to provide 20 hours per week salary to train two CHAs involved in recruitment and implementation of the intervention. A portion of the 20 hours per week would be spent on record keeping, maintaining accurate and complete files, and attending scheduled meetings and inservice classes. The CHC encouraged employment of the CHAs for 20 hours per week for as long as one year at \$9 per hour, which included prorated health insurance benefits. The funding included bus tokens to and from the screening site and \$10 gift certificates to local stores for participation in the intervention. The funding also would be used to support a data-entry clerk, project director, and principal investigator (the primary author, who was on faculty at a nearby four-year university) one day per week throughout the grant period.

As the planning proceeded, the researchers agreed that the primary author would provide administrative leadership and oversight of the intervention and that the project director, who also directed the CHA program, would coordinate and monitor the daily operation of the intervention. The CHAs would manage their individual caseloads and continue relationships with interested women from initial contact through completion of the intervention; however, the CHAs would provide assistance



to each other as needed. The team established a maximum of four contacts for recruitment (phone call or home visit) at various locations during the day and early evening until 5:30 pm for safety reasons. Equally important, the researchers surmised that about 100 African American women who met the inclusion criteria could be recruited from both inner-city communities into the intervention during a one-year period. The decision was determined based on the CHAs' prior successes in linking "hard-to-reach" populations with recommended health and social services in Montgomery County.

Inclusion criteria to participate in the breast health intervention were

- No reported mammography screening in the past two years
- No prior medical history of breast cancer
- No reported symptoms of breast cancer (e.g., pain, lumps, discharge)
- Total annual household income at or below 180% of the federal poverty level (based on established federal poverty level criteria)
- Resident of one of two inner-city communities in Montgomery County
- Willingness to participate in all phases of the intervention.

To avoid duplication of mammography screening provided by Medicaid-covered healthcare services, the researchers excluded women aged 40–49.

### Training Program for Community Health Advisors

The researchers jointly developed a 15-hour training program that included five three-hour modules to achieve success in implementation of the breast health intervention. In developing the training program, the researchers focused on skills and knowledge already existing in the CHA program. The weekly sessions included team building; introduction to the intervention and researcher-developed, self-administered, written pre- and post-tests measuring knowledge of breast health and mammography screening; inclusion criteria; referral of women who did not meet the inclusion criteria; and correct procedures for recording data (intake eligibility, health history, and program evaluation). The latter form included patient satisfaction with the breast health educational intervention and the CHAs and system and structural factors (e.g., wait time, friendliness of staff at the screening site) that have been associated with decreased mammography screening. Other evaluation included

- Referral of others for mammography screening and interest in receiving further breast health screenings
- Challenges in recruitment, the importance of breast cancer detection and follow-up procedures, barriers to mammography screening, and confidentiality of data
- Literacy issues; introduction to culturally sensitive educational materials with appropriate reading levels from the American Cancer Society and Susan G. Komen Breast Cancer Foundation; and established, cooperative arrangements between healthcare professionals and systems in providing follow-up health services when breast cancer is detected
- Role play activities in recruitment and obtaining sensitive sociodemographic and health history data
- Follow-up for a maximum of four contacts
- Telephone courtesy
- Personal safety in recruitment.

The researchers scheduled ongoing meetings bimonthly to ensure success in meeting goals and quarterly inservice sessions to monitor progress. They also scheduled two half-day annual retreats to establish cohesion among team members and direct attention to progress in recruitment. Other important activities included development of an extensive tracking system to monitor progress in recruitment and the intervention. In addition, the team designed posters and colorful, culturally sensitive advertisements to publicize the program.

### Instruments

Prior to implementing the collaborative breast health intervention, the primary author developed and pilot tested a 24-item, self-administered questionnaire using dichotomous items measuring breast health and mammography screening on a similar population of women. After revisions, the questionnaire was submitted to a panel of five experts in clinical practice and education and researchers in breast cancer detection and instrument development. Reviewers identified problems related to simplicity of language and redundancy of similar items to measure the content domain. Therefore, the primary author eliminated terms or phrases that women may have found difficult to understand. Several items that asked the same question using different language to query familial history of breast cancer and knowledge of breast health and mammography screening were revised or eliminated. After further revisions, the primary author achieved significant improvement in the scale items. The revised questionnaire contained 18 items judged to measure the constructs of breast health knowledge and mammography screening. The questionnaire had acceptable reliability measurement ( $r = 0.83$  and  $0.87$ ).

### Procedures

The breast health intervention occurred in six phases (see Table 1). No strict cut-offs were imposed on each intervention phase. Rather, each phase was ongoing as women were recruited into the intervention. The first phase included the initial contact that determined eligibility and interest in the intervention; the second described recruitment into mammography screening through the NBCCEDP and the educational intervention. The third phase answered additional questions about the educational intervention and reminded women to keep their scheduled screening appointments. The fourth and fifth phases included mammography screening and follow-up telephone contact to determine receipt of mammography screening. The final phase completed program evaluation.

## Results

### Demographics

Ninety women met the inclusion criteria and were recruited into the intervention, but only 68 (76%) obtained mammography screening and completed the educational intervention. Eight women (9%) relocated without notification and were lost to follow-up; 14 (16%) declined further contact because of family issues, housing instability, job demands, conflicting information provided by significant others, fears or fatalistic beliefs of breast cancer and mammography screening, or prior negative experiences with healthcare professionals. Significant others strongly determined the women's views,

**Table 1. Collaborative Breast Health Intervention**

Intervention	Outcomes
<b>Phase 1: initial contact</b> <ul style="list-style-type: none"><li>• Aggressive recruitment to increase mammography screening</li><li>• Sought assistance from influential women in two inner-city communities to increase recruitment</li><li>• The intervention was featured on local radio and television stations and in announcements in the local newspaper.</li><li>• During initial contact, completed intake eligibility form and breast health history</li><li>• Determined preference for future contacts (telephone call or scheduled home visit) throughout the intervention</li><li>• Arranged follow-up contact within one week to schedule mammography screening and deliver the educational intervention</li></ul>	<p>Recruitment at various locations (community health centers, adult meal sites, low-income housing units, and a job center)</p> <p>Outreach efforts in barbershops and beauty salons</p> <p>Completed invited interviews with two local radio stations and four local and community newspapers</p> <p>Made initial contact with 111 women. 21 women (19%) did not meet eligibility requirements. 12 (11%) had health insurance coverage or reported mammography screening during the past year. 9 (8%) were at high risk for breast cancer or reported suspicious breast symptoms. They were referred for immediate follow-up and did not receive further contact from a community health advisor (CHA).</p> <p>Most women (90%) preferred a telephone call for future contacts.</p> <p>Ninety women (81%) from the initial contact met the inclusion criteria and agreed to participate in the educational intervention.</p>
<b>Phase 2: follow-up contact to schedule mammography screening and deliver the educational intervention</b> <ul style="list-style-type: none"><li>• The CHAs relied on a tracking system to determine reasons for “no show,” “missed contact,” or “request for no further contact.”</li><li>• Administered the 18-item pretest</li><li>• Delivered the 20- to 30-minute educational intervention with time for questions. Content included recommendations for breast health screenings, risk factors of breast cancer, normal breast anatomy, common myths of mammography screening, and screening procedure</li><li>• Solicited questions that pertained to the breast health educational intervention</li><li>• Left packet of educational materials on breast health for review at a later time</li><li>• Scheduled mammography screening “on the spot,” within four weeks of this contact</li><li>• Obtained written permission to receive mammography screening results.</li><li>• Provided bus token to mammography screening site if needed and \$10 gift certificate to a local store</li></ul>	<p>Fifty women (56%) screened and returned phone calls to the CHAs; they required follow-up contact 2–3 weeks after the initial contact. Eight women (9%) relocated without notification; 14 women (16%) declined further contact because of family issues, housing instability, job demands, fears and fatalistic beliefs of mammography screening or breast cancer, conflicting information provided by significant others, and prior negative experiences with healthcare professionals. All of the women listed more than one reason to decline participation.</p> <p>Almost all of the women were interested in how their test results compared to others in the intervention.</p> <p>Sixty-eight women (76%) participated in the educational intervention.</p> <p>The women asked pertinent questions about breast health.</p> <p>The women were appreciative of the colorful, culturally sensitive packet of educational materials that was left with them for later use.</p> <p>The women were receptive to “on-the-spot” scheduling.</p> <p>None of the women was opposed to this request.</p> <p>Nobody requested a bus token to the mammography screening site. Almost all women preferred the \$10 gift certificate because of lower costs and wider variety in shopping.</p>
<b>Phase 3: follow-up visit</b> <ul style="list-style-type: none"><li>• Contacted women within two weeks of the previous contact to answer additional questions about the scheduled screening and emphasize breast health</li></ul>	<p>Few women asked questions about the scheduled mammography screening or packet of educational materials. When queried, 40 women (59%) stated they had reviewed the packet of materials.</p>
<b>Phase 4: receipt of screening</b> <ul style="list-style-type: none"><li>• Certified x-ray technicians involved in community outreach through the National Breast and Cervical Cancer Early Detection Program provided scheduled mammography screening and second bus token if needed.</li></ul>	<p>Thirty-two women (47%) were “no show” for the initial scheduling of mammography screening and required rescheduling within four weeks. Reasons cited included family obligations, demands in work schedules, and other commitments. None of the women requested a bus token from the mammography screening site.</p>
<b>Phase 5: follow-up contact</b> <ul style="list-style-type: none"><li>• Telephone contact from the project director to the screening site to determine receipt of mammography screening and notify a CHA to make final contact</li></ul>	<p>The project director contacted the screening site within one week of the scheduled screening to determine receipt of mammography. The information was conveyed to the CHAs for final contact.</p>
<b>Phase 6: final contact</b> <ul style="list-style-type: none"><li>• Final contact occurred one week later and eight weeks after the educational intervention. Administered 18-item post-test, program evaluation, and second \$10 gift certificate</li></ul>	<p>Sixty-eight women (76%) who were recruited into the intervention completed the post-test and program evaluation. They provided consistently positive statements about the breast health educational intervention, CHAs, screening site, and certified x-ray technicians.</p>

such as mammography screening should be used in the presence of symptoms or that screenings were responsible for cancer growth. In some instances, significant others expressed prejudiced notions that screenings were not recommended for African American women. Table 2 summarizes the demographic characteristics and health history of the women who met the inclusion criteria.

### Mammography Screening

The team was successful in increasing mammography screening through the NBCCEDP in 68 African American women of lower SES with a median age of 57.8 (SD = 5.28) from two inner-city communities in Montgomery County. This represents a net gain when compared to mammography screening based on self-reported data prior to the intervention (69% versus 55%).

### Knowledge Scores

Table 3 shows the differences in pre- and post-test knowledge scores on each of the 18 items that measured breast health and mammography screening. Gains were made in knowledge scores on several items after participation in the educational intervention. Several questions were statistically significant using paired *t* tests ( $p \leq 0.05$ ). The women were particularly knowledgeable after the education about familial history, breast anatomy and abnormal symptoms, recommendations for breast health and mammography screening, and routine screening procedures. They asked many pertinent questions that were based on myths and misconceptions about breast health and mammography screening. An explanation for the increased knowledge was that 79% of the women were better educated when compared to community assessment data (Wright State University College of Nursing and Health, 2001) that showed lower levels of education. Additionally, the majority of the women asked the CHAs whether their test results were consistent with others in the intervention. All of the women valued the individualized attention and reported that the educational intervention was useful and increased their understanding of breast health and mammography screening. Forty women (59%) reviewed the packet of educational materials after the educational intervention; 60 (88%) stated that the colorful shower cards and one-page fact sheets were culturally sensitive and would be shared with family members or significant others at a later time. Almost all of the women (96%) commented that the educational materials were easily readable and specifically targeted for African American women. Based on feedback during informal discussion, none of the educational materials needs to be revised to improve comprehension or clarity.

### Evaluation of the Intervention

Program evaluation data revealed consistently positive statements about the breast health intervention. The women reported that an important advantage of the intervention was the individualized attention, friendliness, and caring behaviors of the specially trained CHAs. The CHAs' skills encouraged the women to obtain mammography screening. The women emphasized that mammography screening personnel were helpful. Ten women referred a significant other to the intervention. All of the women viewed the wait time of 15 minutes for mammography screening very favorably. Responses (90%) from the women indicated interest in further breast health

**Table 2. Characteristics of Women Who Met the Inclusion Criteria**

Characteristic	Accepted Participation (N = 68)		Declined Participation (N = 22)	
	n	%	n	%
<b>Age (years)</b>				
50–57	54	79	15	68
58–65	14	21	7	32
<b>Education</b>				
Less than high school	14	21	4	18
High school	35	51	10	45
Vocational education	13	19	6	27
Associate degree	4	6	2	9
Bachelor's degree or higher	2	3	–	–
<b>Marital status</b>				
Married	10	15	4	18
Single	12	18	6	27
Divorced or separated	22	32	10	45
Widowed	16	23	2	9
Other	8	12	–	–
<b>Annual household income (\$)</b>				
Less than 10,000	29	43	12	55
10,000–19,000	31	45	10	45
20,000–29,000	8	12	–	–
<b>Number of people in household</b>				
1–2	22	32	7	32
3–4	34	50	13	59
5 or more	12	18	2	9
<b>Work outside the home</b>				
Yes	35	51	13	59
No	33	49	9	41
<b>Work status</b>				
Part-time	22	32	10	45
Full-time	13	19	3	14
Does not work	33	49	9	41
<b>Prior mammography screening</b>				
Yes	47	69	12	55
No	21	31	10	45
<b>Mammography screening in the past three years</b>				
Yes	33	49	10	45
No	35	51	12	55
<b>Under care of a healthcare professional</b>				
Yes	37	54	18	82
No	31	46	4	18

N = 90

Note. Because of rounding, percentages may not total 100.

interventions in both inner-city communities. Similarly, the majority of women (90%) reported that they learned valuable information about breast health and would obtain future breast screenings when reminded by their healthcare professionals or contacted by personnel at the NBCCEDP.

## Discussion

Overall program data analysis showed significant gains in knowledge scores and positive statements about the intervention from African American women of lower SES. The findings from

**Table 3. Differences in Pre- and Post-Test Scores Measuring Knowledge of Breast Health and Mammography Screening**

Knowledge Item	% Correct on Pretest	% Correct on Post-Test	p
<b>Breast health</b>			
A woman is more likely to get breast cancer if she has a family history of breast cancer (mother, sister, aunt, or grandmother).	62	67	0.01
Breast self-examination (BSE) should be performed at the same time each month.	60	68	0.001
Most women's breasts are different in shape and size.	59	67	0.001
Tenderness or fullness of the breast is common before and during menses.	60	68	0.001
Each breast should be checked when performing monthly BSE.	64	68	0.001
The American Cancer Society recommends that all women perform BSE monthly after the change of life (menopause).	64	68	0.001
Age increases a woman's risk of breast cancer.	54	55	0.07
Breastfeeding increases a woman chance of getting breast cancer.	53	54	0.07
Symptoms such as leakage from the nipple, dimpling, or change in appearance should be referred to your doctor or another healthcare provider.	52	53	0.07
<b>Mammography screening</b>			
Women older than 50 should get mammography screening every year.	62	68	0.001
Mammography screening usually is performed by a female x-ray technician.	66	68	0.05
Mammography screening is performed using a special type of x-ray machine.	65	68	0.05
Mammography screening is completed in 15 minutes or less.	65	68	0.05
Mammography screening is a painless procedure.	64	67	0.05
Mammography screening is not required if a woman has had breast cancer.	63	67	0.001
Mammography screening does not contain "too much" radiation.	55	56	0.07
Most women have to get follow-up procedures after mammography screening.	54	56	0.06
Ultrasound is used for further testing after mammography screening.	52	54	0.06

N = 68

Note. Pearson chi-square paired tests measured pre- and post-test differences in scores between the same group and were statistically significant at the 0.05 level.

the intervention corroborate previous findings that specially trained CHAs are invaluable in recruitment efforts (Altpeter et al., 1999; Earp et al., 2002; Eng & Smith, 1995; Erwin et al., 1999; Kang et al., 1994). For example, the CHAs located and recruited eligible women, referred women in high-risk categories into immediate breast health services, delivered the educational intervention in varying locations, and increased the number of African American women of lower SES who received mammography screening through the NBCCEDP.

In support of the findings, the researchers conducted cost-effectiveness data analysis to determine the degree to which the desired program goals were accomplished (Finkler & Kovner, 2000). Data analysis demonstrated that the CHAs (paraprofessionals) who were paid \$9 per hour for recruitment and outreach efforts were able to deliver the 30-minute educational intervention and increase mammography screening in 68 eligible women who had not obtained recommended mammography screening during the past two years. Moreover, the packet of culturally sensitive educational materials not only increased the women's breast health knowledge but also had the potential to reach a larger number of African American women of lower SES who were less likely to obtain mammography screening.

The findings of the intervention are consistent with previous studies that found that fears and fatalistic beliefs (Bowen et al., 1997; Dignan et al., 1994; Fowler, 2003; Glanz et al., 1996; Gregg & Curry, 1994; Lannin et al., 1998; Parks, 1998; Phillips et al., 1999, 2001; Pinn, 1998; Powe, 1995; Powe & Weinrich, 1999; Salazer & de Moor, 1995; Thompson et al., 1996; Williams, 1998) and prior negative experiences with healthcare professionals were associated with decreased mammography screening in African American women of lower

SES (Baldwin, 1996; Bibb, 2001; Bobo et al., 1999; Bourjolly, 1998; Champion & Menon, 1997; Facione & Giancarlo, 1998; Facione et al., 2002; Fowler; Makuc et al., 1999; Miller & Champion, 1997; Phillips et al., 1999, 2001; Richardson & Ball-Cook, 1998). Evidence of the influence of cultural and religious beliefs on lower mammography screening was not measured in this intervention as it was in other articles. However, a number of additional factors accounted for decreased mammography screening, such as housing instability, job demands, and family issues that were not identified in the empirical literature. Research is needed to explore the influence of such factors on mammography screening.

### Limitations

A major and noteworthy limitation of the intervention was the high drop-out rate of 22% of eligible women. Determining the reason is difficult; however, many interested women (80%) declined participation because the six-week interval between the initial contact and mammography screening was excessive. The researchers also experienced unexpected delays in delivering the intervention. For example, more than half of the women (56%) told the CHAs that they screened phone calls when they did not recognize the person's voice or suspected a bill collector, resulting in delays in follow-up contact and receipt of mammography screening. A challenge to implementing future interventions is to provide mammography screening in a shorter timeframe without influencing the time interval between pre- and post-test measurements. Additionally, 14 (16%) women who met the inclusion criteria declined participation because of other issues and also screened phone calls, thereby accounting for the high drop-out rate. These factors should be considered in further interventions.



## Implications for Nursing

The breast health intervention had enormous appeal because it was coordinated with the NBCCEDP, which provides women of lower SES with available mammography screening and accurate, up-to-date information about breast health. The intervention was unique because healthcare personnel at the NBCCEDP were connected with the intervention. To date, no similar program focuses on the breast health of the same population in both inner-city communities in Montgomery County. A spillover effect occurred, increasing the African American community's awareness of and knowledge about breast health and mammography screening. One year after the intervention concluded, the researchers continued to receive telephone calls from former participants, interested women, and representatives from community agencies for mammography screening and the educational intervention. Other healthcare professionals have proposed similar strategies based on the intervention to link high-risk or vulnerable populations with needed services.

To improve the breast health intervention and potentially reach a larger number of eligible, interested women of lower SES, the researchers recommend a shorter time period of five phases rather than six phases of the intervention. The decision is based on the fact that a few women (16%) in the initial contacts were very receptive to the intervention, including mammography screening, in a shorter time period. In addition, the eight-week interval between the pre- and post-test resulted in several uncontrolled threats to validity such as history, maturation, testing, instrumentation, and statistical regression (Polit & Beck, 2004). For example, the pre- and post-test intervention design may have resulted in a threat of instrumentation, indicating increased gains in knowledge scores. However, the women may have become familiar with the questions between pre- and post-testing, resulting in less accurate scores. The design also may have suffered from statistical regression of mean scores, resulting in type 1 error or false judgment that the findings are significant. The latter threat to internal validity occurs when changes from pre- to post-test scores are caused by factors other than the intervention. Based on the important concerns in intervention design, future interventions should have a longer interval between the pre- and post-test to substantiate generalizable findings of the knowledge questionnaire.

In designing future breast health interventions, oncology nurses involved in community outreach should consider the impact of family issues, housing instability, job demands,

and conflicting information provided by significant others that were reported in this intervention. Therefore, interventions that include significant others may be effective in disseminating accurate, up-to-date breast health information to a larger number of individuals. Future research is needed to determine the influence of follow-up reminder phone calls for mammography screening. Another important area for further research is to evaluate the effects of an intervention such as this over time. For example, do women who participate in interventions change their behaviors over time? Or must healthcare practitioners remind or encourage women to participate in screening on a recurring basis for the rest of their lives? Oncology nurses providing outreach breast health interventions for similar groups of women should incorporate evaluation strategies at baseline and periodically throughout the intervention to provide more comprehensive data and, therefore, enhance the credibility of findings. To maximize success, oncology nurses should work collaboratively with other healthcare personnel such as certified x-ray technicians and influential people in the community who may provide different perspectives or offer informative and insightful information throughout planning and evaluation that may be useful in future breast health interventions for African American women of lower SES.

## Future Directions

Based on the women's extremely positive feedback, further plans are under way to implement a "train-the-trainer" collaborative intervention to increase knowledge of breast health and mammography screening in a similar group of interested African American women in both inner-city communities in Montgomery County. Following the educational intervention, women will disseminate the information to other African American women in various settings such as church groups, places of residence, and community meetings. Continual collaboration with healthcare personnel at the NBCCEDP and influential people in the inner-city communities is essential to increase knowledge of breast health and mammography screening in African American women of lower SES.

*The authors would like to thank Dorothy Brooten, PhD, RN, FAAN, and JoAnne M. Youngblut, PhD, RN, FAAN, of the Research A-Team, LLC, for the helpful critique of this manuscript.*

**Author Contact:** Barbara A. Fowler, DNSc, APRN, BC, can be reached at [barbara.fowler@wright.edu](mailto:barbara.fowler@wright.edu), with copy to editor at [ONFEditor@ons.org](mailto:ONFEditor@ons.org).

## References

- Altpeter, M., Earp, J.A., Bishop, C., & Eng, E. (1999). Lay health advisor activity levels: Definitions from the field. *Health Education and Behavior*, 26, 495–512.
- Ashing-Giwa, K. (1999). Health behavior change models and their socio-cultural relevance for breast cancer screening in African American women. *Women and Health*, 28(4), 53–71.
- Baldwin, D. (1996). A model for describing low-income African American women's participation in breast and cervical cancer early detection and screening. *Advances in Nursing Science*, 19(2), 27–42.
- Bibb, S.C. (2001). The relationship between access and stage at diagnosis of breast cancer in African American and Caucasian women. *Oncology Nursing Forum*, 28, 711–719.
- Bobo, J.K., Dean, D., Stovall, C., Mendez, M., & Caplan, L. (1999). Factors that may discourage annual mammography among low-income women with access to free mammograms: A study using multi-ethnic, multi-racial focus groups. *Psychological Reports*, 85, 405–416.
- Bourjolly, J.N. (1998). Differences in religiousness among black and white women with breast cancer. *Social Work in Health Care*, 28(1), 21–39.
- Bowen, D., Hickman, K.M., & Powers, D. (1997). Importance of psychological variables in understanding risk perceptions and breast cancer screening of African-American women. *Women's Health*, 3(3–4), 227–242.
- Burnett, C.B., Steakley, C.S., & Tefft, M.C. (1995). Barriers to breast and cervical cancer screening in underserved women of the District of Columbia. *Oncology Nursing Forum*, 22, 1551–1557.



- Burns, R.B., McCarthy, E.P., Freund, K.M., Marwill, S.L., Schwartz, M., Ash, A., et al. (1996). Black women receive less mammography screening even with similar use of primary care. *Annals of Internal Medicine*, 125(3), 173–182.
- Caplan, L.S., Helzlsouer, K.J., Shapiro, S., Wesley, M.N., & Edwards, B.K. (1996). Reasons for delay in breast cancer diagnosis. *Preventive Medicine*, 25, 218–224.
- Center for Healthy Communities. (1997). *Center for Healthy Communities: A partnership to ensure healthy lives*. Dayton, OH: Author.
- Centers for Disease Control and Prevention. (2003). *The National Breast and Cervical Cancer Early Detection Program: Tracking program outcomes*. Retrieved May 23, 2003, from <http://www.cdc.gov/cancer/nbccedp/spot.htm>
- Centers for Disease Control and Prevention. (2004). *Behavioral risk factor surveillance system prevalence data, Ohio—2002*. Retrieved April 19, 2004, from <http://apps.nccd.cdc.gov/b...e.asp?cat=WH&yr=2002&qkey=1984&state=O>
- Champion, V., & Menon, U. (1997). Predicting mammography and breast self-examination in African American women. *Cancer Nursing*, 20, 315–322.
- Champion, V.L., & Scott, C.R. (1997). Reliability and validity of breast cancer screening belief scales in African American women. *Nursing Research*, 46, 331–337.
- Chang, S.W., Kerlikowske, K., Napoles-Springer, A., Posner, S.F., Sickles, E.A., & Perez-Stable, E.J. (1996). Racial differences in timeliness of follow-up after abnormal screening mammography. *Cancer*, 78, 1395–1402.
- Combined Health District of Montgomery County. (2004). *Healthy people 2004* [Unpublished report]. Dayton, OH: Author.
- Danigelis, N.L., Worden, J.K., & Mickey, R.M. (1996). The importance of age as a context for understanding African-American women's mammography screening behavior. *American Journal of Preventive Medicine*, 12, 358–366.
- Davis, T.C., Arnold, C., Berkel, H.J., Nandy, I., Jackson, R.H., & Glass, J. (1996). Knowledge and attitude on screening mammography among low-literate, low-income women. *Cancer*, 78, 1912–1920.
- Dignan, M.B., Michielutte, R., Jones-Lighty, D.D., & Bahnson, J. (1994). Factors influencing the return rate in a direct mail campaign to inform minority women about prevention of cervical cancer. *Public Health Reports*, 109, 507–511.
- Earp, J.A., Eng, E., O'Malley, M.S., Altpeter, M., Rauscher, G., Mayne, L., et al. (2002). Increasing use of mammography screening among older, rural African American women: Results from a community trial. *American Journal of Public Health*, 92, 646–654.
- Eng, E., & Smith, J. (1995). Natural helping functions of lay health advisors in breast cancer education. *Breast Cancer Research and Treatment*, 35, 23–29.
- Erwin, D.O., Spatz, T.S., Stotts, R.C., & Hollenberg, J.A. (1999). Increasing mammography practices by African American women. *Cancer Practice*, 7(2), 78–85.
- Facione, N.C., & Giancarlo, C.A. (1998). Narratives of breast symptom discovery and cancer diagnosis: Psychologic risk for advanced cancer at diagnosis. *Cancer Nursing*, 21, 430–440.
- Facione, N.C., Miaskowski, C., Dodd, M.J., & Paul, S.M. (2002). The self-reported likelihood of patient delay in breast cancer: New thoughts for early detection. *Preventive Medicine*, 34, 397–407.
- Finkler, S.A., & Kovner, C.T. (2000). *Financial management for nurse managers and executives* (2nd ed.). Philadelphia: Saunders.
- Fowler, B.A. (2003). Claiming health: Mammography screening decision making of older, urban African-American women. (Doctoral dissertation, Rush University, 2003). *Dissertation Abstracts International*, 308, 2875.
- Foxall, M.J., Barron, C.R., & Houfek, J.F. (2001). Ethnic influences on body awareness, trait anxiety, perceived risk, and breast and gynecologic cancer screening. *Oncology Nursing Forum*, 28, 727–742.
- Freeman, H.P., Muth, B.J., & Kerner, J.F. (1995). Expanding access to cancer screening and clinical follow-up among the medically underserved. *Cancer Practice*, 3, 19–30.
- Glanz, K., Resch, N., Lerman, C., & Rimer, B.K. (1996). Black-white differences in factors influencing mammography use among employed female health maintenance organization members. *Ethnicity and Health*, 1(3), 207–220.
- Gregg, J., & Curry, R.H. (1994). Explanatory models for cancer among African-American women at two Atlanta neighborhood health centers: The implications for a cancer screening program. *Social Science and Medicine*, 39, 519–526.
- Herskovits, M.J. (1990). *The myth of the Negro past*. Boston: Beacon Press.
- Kang, S.H., Bloom, J.R., & Romano, P.S. (1994). Cancer screening among African-American women: Their use of tests and social support. *American Journal of Public Health*, 84(1), 101–103.
- Kinney, A.Y., Emery, G., Dudley, W.N., & Croyle, R.T. (2002). Screening behaviors among African American women at high risk for breast cancer: Do beliefs about God matter? *Oncology Nursing Forum*, 29, 835–843.
- Lannin, D.R., Matthews, H.F., Mitchell, J., Swanson, M.S., Swanson, F.H., & Edwards, M.S. (1998). Influence of socioeconomic and cultural factors on racial differences in late-stage presentation of breast cancer. *JAMA*, 279, 1801–1807.
- Makuc, D.M., Breen, N., & Freid, V. (1999). Low income, race, and the use of mammography. *Health Services Research*, 34(1, Pt. 2), 229–239.
- Mandelblatt, J.S., & Yabroff, K.R. (2000). Breast and cervical cancer screening for older women: Recommendations and challenges for the 21st century. *Journal of the American Medical Women's Association*, 55(4), 210–215.
- McCarthy, E.P., Burns, R.B., Coughlin, S.S., Freund, K.M., Rice, J., Marwill, S.L., et al. (1998). Mammography use helps to explain differences in breast cancer stage at diagnosis between older black and white women. *Annals of Internal Medicine*, 128, 729–736.
- McDonald, P.A., Thorne, D.D., Pearson, J.C., & Adams-Campbell, L.L. (1999). Perceptions and knowledge of breast cancer among African-American women residing in public housing. *Ethnicity and Disease*, 9(1), 81–93.
- Mickey, R.M., Durski, J., Worden, J.K., & Danigelis, N.L. (1995). Breast cancer screening and associated factors for low-income African-American women. *Preventive Medicine*, 24, 467–476.
- Miller, A.M., & Champion, V.L. (1997). Attitudes about breast cancer and mammography: Racial, income, and educational differences. *Women and Health*, 26(1), 41–63.
- Miller, L.Y., & Hailey, B.J. (1993). Cancer anxiety and breast cancer screening in African-American women: A preliminary study. *Women's Health Issues*, 4(3), 170–174.
- National Cancer Institute. (2004). NCI statement on mammography screening. Retrieved November 20, 2004, from <http://www.nci.nih.gov/newscenter/mammstatement31jan02>
- National Center for Health Statistics. (2001). *Data file documentation, National Health Interview Survey, 2000* [Machine readable data file and documentation]. Hyattsville, MD: Author.
- Parks, C.P. (1998). Spirituality and religious practices among African Americans: Neglected health promotion and disease prevention variables. *Journal of Health Education*, 29(2), 126–129.
- Pearlman, D.N., Rakowski, W., Clark, M.A., Ehrich, B., Rimer, B.K., Goldstein, M.G., et al. (1997). Why do women's attitudes toward mammography change over time? Implications for physician-patient communication. *Cancer Epidemiology, Biomarkers and Prevention*, 6, 451–457.
- Phillips, J.M., Cohen, M.Z., & Moses, G. (1999). Breast cancer screening and African American women: Fear, fatalism, and silence. *Oncology Nursing Forum*, 26, 561–571.
- Phillips, J.M., Cohen, M.Z., & Tarzian, A.J. (2001). African-American women's experiences with breast cancer screening. *Journal of Nursing Scholarship*, 33(2), 135–140.
- Pinn, V.W. (1998). Improving the health of minority women: The role of research. In *Closing the gap: A newsletter of the Office of Minority Health* (p. 3). Washington, DC: U.S. Department of Health and Human Services Public Health Service.
- Polit, D.F., & Beck, C.T. (2004). *Nursing research: Principles and methods* (7th ed.). Philadelphia: Lippincott Williams and Wilkins.
- Powe, B.D. (1995). Cancer fatalism among elderly Caucasians and African Americans. *Oncology Nursing Forum*, 22, 1355–1359.
- Powe, B.D., & Weinrich, S. (1999). An intervention to decrease cancer fatalism among rural elders. *Oncology Nursing Forum*, 26, 583–588.

- Price, J.H., Desmond, S.M., Slenker, S., Smith, D., & Stewart, P.W. (1992). Urban black women's perceptions of breast cancer and mammography. *Journal of Community Health, 17*(4), 191–204.
- Richardson, T., & Ball-Cook, M. (1998). Culturally competent health care. African-American practitioners. *Journal of Multicultural Nursing and Health, 4*(1), 11–15.
- Roberson, N.L. (1997). Comparison of breast screening outcomes from a cancer control intervention for African-American and white women in western New York. *Journal of the Association for Academic Minority Physicians, 8*(2), 29–33.
- Rojas, M., Mandelblatt, J., Cagney, K., Kerner, J., & Freeman, H. (1996). Barriers to follow-up of abnormal screening mammograms among low-income minority women. *Ethnicity and Health, 1*(3), 221–228.
- Salazar, M.K., & de Moor, C. (1995). An evaluation of mammography beliefs using a decision model. *Health Education Quarterly, 22*, 110–126.
- Thompson, B., Montano, D.E., Mahloch, J., Mullen, M., & Taylor, V. (1996). Attitudes and beliefs toward mammography among women using an urban public hospital. *Journal of Health Care for the Poor and Underserved, 8*(2), 186–201.
- U.S. Department of Health and Human Services Public Health Service. (2000). *Healthy people 2010*. Washington, DC: U.S. Governmental Printing Office.
- Vellozzi, C.J., Romans, M., & Rothenberg, R.B. (1996). Delivering breast and cervical cancer screening services to underserved women: Part I. Literature review and telephone survey. *Women's Health Issues, 6*(2), 65–73.
- Ward, E., Jemal, A., Cokkinides, V., Singh, G.K., Cardinez, C., Ghafoor, A., et al. (2004). Cancer disparities by race/ethnicity and socioeconomic status. *CA: A Cancer Journal for Clinicians, 54*, 78–93.
- Williams, R.W. (1998). Low-income rural Southern women: Health promotion and breast cancer control. *Quality of Life—A Nursing Challenge, 6*(2), 31–36.
- Wright State University College of Nursing and Health. (2001). *Community health assessment*. Dayton, OH: Author. 