

The Delta Project: Increasing Breast Cancer Screening Among Rural Minority and Older Women by Targeting Rural Healthcare Providers

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Purpose/Objectives: To test a multimethod approach designed for rural healthcare providers to increase breast cancer screening among low-income, African American, and older women.

Design: Two-year experimental pretest/post-test with random assignment by group.

Setting: Primary healthcare providers' offices.

Sample: 224 nurses, physicians, and mammography technicians.

Methods: Standardized patients to observe and record healthcare providers' performances, followed by direct feedback, newsletters, posters, pocket reminder cards, and lay literature about screening to use in clinics.

Main Research Variables: Healthcare providers' knowledge and attitudes as measured by survey responses, skills as measured by a checklist, and the provision of breast cancer screening as measured by mammography facilities' data.

Findings: Healthcare providers significantly improved in demonstration of breast cancer screening practice after the intervention. Nurses performed significantly better than physicians on the breast examination during the post-test. More women older than 50 received mammograms in the experimental counties than in the comparison counties. Culturally sensitive lay literature is needed for African American women with low literacy.

Conclusions: Successful interventions included use of standardized patients to teach healthcare providers in their office settings, prompts such as posters and pocket reminder cards, and easy-to-read newsletters.

Implications for Nursing: Physicians and nurses play a powerful role in motivating women to have mammograms and clinical breast examinations and to practice breast self-examination. Interventions that help these providers fulfill that role should be implemented.

Key Points . . .

- As a group, older women with lower income and less education have lower rates of breast cancer screening despite Medicare coverage of these services.
- Encouragement and instruction by healthcare professionals, particularly physicians, can increase breast cancer screening rates.
- Increasing healthcare professionals' knowledge and providing structured, multifaceted programs of instruction can increase screening rates in rural settings.
- Lay literature is lacking about breast cancer screening that is appropriate for African American women and women with low literacy that providers can use to reinforce teaching.

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Digital Object Identifier: 10.1188/03.ONF.669-677

An estimated 211,300 American women will be diagnosed with invasive breast cancer and an estimated 39,800 will die from the disease in 2003 (Susan G. Komen Breast Cancer Foundation, 2003). It is the leading cause of cancer deaths among women ages 40–59 (Susan G. Komen Breast Cancer Foundation). In general, the frequency of late-stage diagnosis and breast cancer mortality are higher among African American women (Dignan, 2000; Greenlee, Hill-Harmon, Murray, & Thun, 2001) and Caucasian women of low socioeconomic status (Franzini, Williams, Franklin, Singletary, & Theriault, 1997; Li, Burton, & Glass, 2001; Wells & Horm, 1992).

The long-awaited decrease in breast cancer mortality rates does not apply to rural minority and older women. From 1973–1995, women 65 years of age and older experienced a 1% increase in breast cancer mortality for African American women versus a 0.6% decrease for Caucasian women (National Cancer Institute, 1997). Lack of breast cancer screening explains much of this discrepancy (McCarthy et al., 1998). Mammography and clinical breast examination (CBE) are included in recommended screening methods, and monthly breast self-examination (BSE) is recommended for women between regular screening examinations (American Cancer Society, 2003; Apantaku, 2000; Susan G. Komen Breast Cancer Foundation, 2003).

Barriers to Screening

Women who are older, of lower income, and with lower educational attainment continue to have lower breast cancer screening rates (Kelaher & Stellman, 2000; O'Malley et al., 2001). One of the most common reasons that older women, regardless of race, do not get mammograms is because their physicians do not recommend them (Caplan, Wells, & Haynes, 1992; Coleman & O'Sullivan, 2001; MacDowell, Nitz-Weiss, & Short, 2000; Vernon et al., 1992). Medicare coverage of screening mammography should have reduced the barriers of cost and inadequate insurance coverage previously reported by physicians (Henry, Ogle, & Snellman, 1987; O'Leary, deParedes, Tritschler, & Barr, 1989; Orlandi, 1987), but research conducted by the National Cancer Institute Breast Cancer Screening Consortium showed that the Medicare benefit had little effect for Caucasian women and no effect for African American women (Coleman & O'Sullivan). Furthermore, having private health insurance remains a predictor for physicians recommending a mammogram (Fretts et al., 2000; Kelaher & Stellman; May, Keife, Funkhouser, & Fouad, 1999). Attitude (e.g., perceived ineffectiveness), knowledge (e.g., confusion about guidelines), and organizational factors (e.g., scheduling problems) are additional barriers for physicians to implement cancer detection procedures (Battista, Williams, & MacFarlane, 1986; Carter, Belcher, & Inui, 1981; Davidson, Fletcher, Retchin, & Duh, 1984; Dunn, Shridharani, Lou, Bernstein, & Horowitz, 2001; Gemson & Elinson, 1986; MacDowell et al.; McPhee, Richard, & Solkowitz, 1986; Montano, Manders, & Phillips, 1990; Orlandi; Sloane et al., 1985).

Need to Target Rural Healthcare Providers

Cancer control and prevention in physicians' daily practices need greater emphasis (Cummings, Whetstone, Shende, & Weismiller, 2000; Frame, 2000), especially for physicians with a high proportion of minority and older patients (Paskett et al., 1999; Preston, Scinto, Grady, Schulz, & Petrill, 2000). Physicians often do not discuss cancer-screening tests with patients because of lack of time (Dunn et al., 2001). Nurses working in primary care settings should play a greater role in cancer screening (Coleman, Coon, Fitzgerald, & Cantrell, 2001; Costanza et al., 1999). A special need exists to target rural healthcare clinics because they are less likely to have access to meetings for educational offerings or sufficient num-

bers of physicians to provide preventive services (Kephart, Kaemmerer, & Brown, 1993; Norris, Coombs, & Carline, 1996). Furthermore, rural clinics serve people who are less likely to have transportation (Fortney, Rost, Zhang, & Warren, 1999) and telephones (Bogle et al., 2001) than those in urban areas. Thus, appropriate breast cancer screening must be a part of any rural clinic visit.

Purpose and Hypothesis

The purpose of this two-year, experimental study was to test a multimethod intervention targeting rural healthcare providers in their clinics to increase breast cancer screening in a patient population that experiences higher mortality rates than the general population. The hypothesis was that, in relation to healthcare providers in the comparison group, providers who used the experimental intervention strategies would exhibit significantly greater increases in knowledge concerning screening guidelines for the early detection of breast cancer, improvement in their performance of CBE, more positive attitudes toward the use of these methods, and improvement in the provision of breast cancer screening to women in rural areas.

Framework

The PRECEDE-PROCEED Model for health education planning provides direction to develop a model for a rural health education program (Green & Kreuter, 1999; Green & Ottoson, 1999). PRECEDE is an acronym for predisposing, reinforcing, and enabling factors in educational diagnosis and evaluation. PROCEED means policy, regulatory, and organizational constructs in educational and environmental development. The framework is founded on the disciplines of epidemiology; the social, behavioral, and educational sciences; and healthcare administration. Two fundamental propositions are emphasized: (a) health and health risks are caused by multiple factors and (b) because health and health risks are determined by multiple factors, efforts to effect behavioral, environmental, and social change must be multidimensional or multisectoral (Green & Kreuter; Green & Ottoson). The model is recognized as a robust framework in health promotion, and all factors incorporated in the model are relevant and important (Imamura, 2002; Mazur & Szumska-Olczak, 2000; Miilunpalo, 2001) (see Figure 1).

According to the PRECEDE-PROCEED Model, the epidemiologic indicators of breast cancer noted in the Delta region

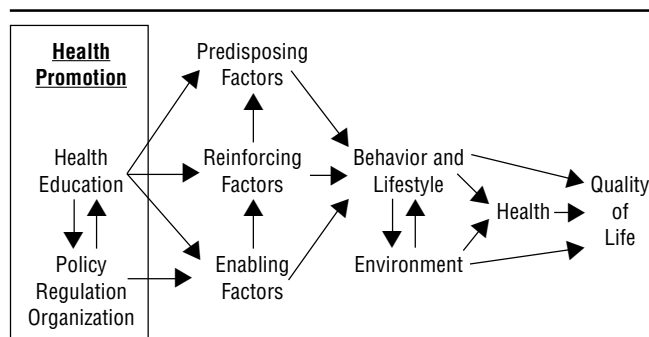


Figure 1. Components of Green's PRECEDE-PROCEED Model

Note. Based on information from Green & Kreuter, 1999; Green & Ottoson, 1999. Copyright 1999 by McGraw-Hill. Reprinted with permission.

(i.e., low-income, African American, and older women) were considered to denote a serious health problem that affected the quality of life of minority and older women. Classifying antecedent behavioral variables into predisposing, enabling, and reinforcing factors helped to identify specific intervention strategies and messages necessary to influence healthcare providers' behaviors. Predisposing factors are personal attitudes, beliefs, values, and knowledge that motivate a healthcare provider to act. For example, a physician or nurse practitioner may not know that new mammography technology is state-of-the-art with very low radiation exposure or about the benefit of breast cancer mortality reduction with mammography. Enabling factors include the resources and skills necessary to act. For example, the provider may not be confident or proficient in CBE skills. Reinforcing factors include influential colleagues who may promote or discourage healthcare providers to act.

Enabling Methods of Planning and Organizing Within Everyone's Reach (i.e., EMPOWER) (Gold, Green, & Kreuter, 1997) software (CD-ROM and manual) using the PRECEDE-PROCEED Model is available to provide technical guidance and assistance to those involved in planning and implementing community-level cancer prevention and control interventions. EMPOWER begins with the recognition that program planning encompasses many complex skills, techniques, and data from a variety of fields.

Methods

Setting

The rural nature of Arkansas, the low per capita income, the high percentage of citizens older than 65, and the high regional concentration of African Americans in the Delta region make cancer education and screening a significant state need. Arkansas is one of three states identified by the Lower Mississippi Delta Development Commission as among the poorest and most economically depressed in the nation. In 1998, Arkansas ranked 48th in the nation by per capita income at \$21,167; although the poverty rate for the United States is 13%, in the Delta, it is 27% (Agricultural Research Service, 1999). About 14% of the population is 65 and older (U.S. Census Bureau, 2001). African Americans comprise 16% of the population compared with 12% for the United States (U.S. Census Bureau, 2001).

A great need exists to improve rural medical services in Arkansas, where health care has been damaged by the closing of rural hospitals (Blanchfield, Franco, & Mohr, 2000; Bull, Krout, Rathbone-McCuan, & Shreffler, 2001). Eighty-two percent of the counties in the Arkansas Delta region include Health Professional Shortages Areas (Bureau of Health Professions, 2001). The Delta region has only 0.8 physicians per 1,000 population; the U.S. average is 2 per 1,000 (Mississippi Area Health Education Center, 1999). Thus, the Delta Project tested a multimethod approach designed for rural healthcare providers to increase breast cancer screening among a population of low-income, African American, and older women.

Study Population

Healthcare providers in primary care clinics located in 27 counties in the Arkansas Delta were invited to participate in the Delta Project. The healthcare providers were physicians

(family practice, obstetrics and gynecology, internal medicine), nurses, and mammography technicians. All but one of the clinics participated in the project. The counties were divided into two groups. The intervention group, chosen by a coin toss, included healthcare providers in 13 counties in a northern area of the Arkansas Delta, and the comparison group included healthcare providers in 14 counties in a southern area of the Arkansas Delta. The target counties in the south had an African American population of 29%, compared with 21% in the north. A high percentage (11%–23%) of the households in the 27 counties were below the poverty level. Twelve percent of adults had less than a ninth-grade education, compared with 8% of the U.S. population (U.S. Census Bureau, 1996, 1998). Both areas encompass small, stable, rural communities with 32 people per square mile in a region with a limited number of primary care and preventive health services. The areas are separated by natural geographic boundaries (i.e., the Mississippi River on the east) and two counties between the groups of study counties. These two counties were excluded from this study because they had been included in a pilot/feasibility study that had similar goals.

Study Design

The project period was May 1996–June 1998. A delayed treatment, pretest/post-test design was used. The intervention group received the interventions in year one; in year two, the group that previously served as the comparison group received the interventions following the post-test. Outcome measures consisted of changes in the healthcare providers' knowledge and attitudes and changes in the frequency and provision of breast cancer screening (i.e., CBE and mammography).

Interventions included the use of standardized patients to observe and record healthcare professionals' performance followed by direct feedback and newsletters to inform healthcare providers about screening methods. A standardized patient is a lay woman trained in a particular clinical scenario to score and teach CBE using herself as a model. As part of the intervention, healthcare professionals in the intervention group received four newsletters titled *The Delta Project NEWS*. In a format that was easy to read and clinically relevant for busy healthcare professionals in primary care, the newsletters provided the latest information about breast cancer screening, diagnosis, treatment, and rehabilitation. A brief survey to evaluate the effectiveness of the newsletters was included in the winter issue. A coupon for a low-cost mammogram (\$40) was included in each issue of the newsletter. Healthcare professionals could photocopy the coupon to give to patients, but the researchers did not track coupon use.

Two sets of posters presenting key points about CBE and the importance of routine screening mammograms, along with laminated pocket-size cards with the same information (see Figure 2), were provided to the clinics in the intervention group to display. The posters were designed to prompt women to discuss screening issues with providers. The posters also were intended to remind the providers of screening recommendations. Patient education materials about breast cancer screening available from the National Cancer Institute and American Cancer Society were mailed to clinics in the intervention group.

Key Points of Clinical Breast Examination

- Position: side-lying for lateral half of breast, supine for medial half of breast
- Area: 100% of breast (clavicle to the bra line and midsternum to the mid-axillary line)
- Palpate with the pads of three fingers.
- Pressure: light, medium, deep over each area
- Take about one second for each pressure.
- Motion: small, dime-sized circle
- Pattern: vertical strip
- Always emphasize doing monthly breast self-examination.

Key Points of Breast Self-Examination

- Check your breasts one week after your period.
- Stand before a mirror and look for changes.
- Dimpling, puckering, and scaling could be signs of cancer.
- Lie down on side for outer half and on back for inner half.
- Three pressures in dime-sized circles
- Use the pads of your middle three fingers.
- Feel the breast in overlapping areas.
- Start in the underarm and move up and down (vertical strip) across the breast until you reach the center.
- Call your doctor if you notice any lumps or changes.

Figure 2. Information on Laminated Pocket Cards Presenting Key Points Concerning Breast Examination

Outcome measures were (a) knowledge of the American Cancer Society's screening guidelines as measured by surveys; (b) attitudes toward the use of the recommended screening guidelines as measured by surveys; (c) ability to do a focused breast health interview, perform CBE, and give appropriate advice regarding breast cancer screening and teaching BSE, as measured by performance scores; (d) number of mammography referrals according to self-report in surveys; and (e) number of women obtaining screening mammograms according to mammography facilities' records. The pretest, CBE training for the healthcare professionals in the intervention group, and post-test were administered at the clinic sites, and lunch was provided toward the end of the visit. The pretest, consisting of a survey and performance examination, and interventions for the intervention group, were administered from May 1996–April 1997. The post-test was administered from November 1997–June 1998.

Instruments

The survey instrument was adapted from surveys developed by the American Cancer Society and pretested with a group of healthcare providers in areas of the Delta other than those included in the study (American Cancer Society, 1985, 1990). The survey included items to assess demographics (i.e., race and sex), professional training, and practice characteristics and questions about their beliefs, attitudes, and behaviors in relation to breast cancer screening. Examples of the 58 questions on the survey follow.

- Compared to five years ago, would you say that more or less attention is being given to early breast cancer detection in asymptomatic women?
- At what age do you usually begin to do CBE?
- Compared to five years ago, would you say that you are more or less likely to order a screening mammogram in an asymptomatic woman?

A research assistant traveling to the primary care clinics ad-

ministered the paper-and-pencil survey to the healthcare providers in both study groups.

Standardized patients who traveled to the primary care clinics with the research assistant gave the performance examinations. At the University of Arkansas for Medical Sciences (UAMS), standardized patients have high school or advanced degrees and include homemakers, nurses, secretaries, and teachers. They are dedicated and motivated to the task and have shown their abilities to teach. During a two-week training program, the women watched videotapes about breast examination and studied a breast education manual developed by UAMS faculty. They memorized a clinical scenario in which a woman who is concerned about breast cancer presents to a clinic for breast examination. The women learned their own breast anatomy and physical findings by attending a one-hour didactic session on breast anatomy and abnormalities and having a thorough breast examination and explanations by a surgical breast specialist. Finally, they practiced teaching as a group and rehearsed the clinical scenario with a mock student. The investigators standardized the teaching. Nine standardized patients assisted with the project. All were college graduates, eight were Caucasian and one was African American, seven were married, two were divorced, and their mean age was 36 (range = 32–43 years).

The instrument to assess CBE proficiency was developed previously through a paired comparison study and validated in educational and practice settings. The inter-rater reliability is 95% (Coleman et al., 2001; Coleman & Pennypacker, 1991; Coleman, Riley, Fields, & Prior, 1991). The performance examination consisted of a focused breast health interview, CBE, and advice regarding breast cancer screening, including teaching BSE. The instrument to assess the performance examination included 12 items related to asking about risk factors and symptoms, 2 items about preparing for the physical examination, 21 items about performing CBE, 5 items about making screening recommendations, and 5 items about communicating with a patient (see Figure 3).

Each mammography facility in the intervention area ($n = 13$) and comparison area ($n = 13$) maintained records of the date of each woman's mammogram, her age and race, and whether it was the woman's first mammogram. The facilities collected this information for a three-month period at the beginning of the study and then again for a three-month period at the end of the study. Because Arkansas does not have a breast cancer screening database or offer mammograms to women in a program that invites those belonging to a particular cohort for screening, the actual number of women eligible for screening during the data-collection period is not known. Furthermore, the mammography facilities did not differentiate between screening and diagnostic mammograms.

Data analysis included the use of descriptive statistics, t tests, chi-square, and analysis of variance in SPSS® (SPSS Inc., Chicago, IL).

Results

A total of 224 primary care physicians, nurses, and mammography technicians in 27 counties participated (see Table 1). Because survey and performance score data were collected in one pretest and one post-test visit to each clinic,

Breast Cancer Screening Performance Checklist

Standardized patient _____

Date _____

Type of healthcare provider: ☐ Nurse ☐ Physician

Standardized patient's instructions: Fill in the bubble if the healthcare professional *completed* the task.

Risk Factor/Symptoms:

- (1) 1. Pain
- (1) 2. Discharge
- (1) 3. Mass
- (1) 4. Breast self-examination
- (1) 5. Family history
- (1) 6. Alcohol use
- (1) 7. Exercise
- (1) 8. Smoking history
- (1) 9. Birth control pills/medications
- (1) 10. Diet and caffeine
- (1) 11. Age at first pregnancy
- (1) 12. Onset of period
- (Total = 12)**

Screening Recommendations:

- (1) 13. Screening mammography at age 40
- (1) 14. Breast self-examination monthly
- (1) 15. Yearly clinical breast examination
- (1) 16. Instructed me in breast self-examination
- (1) 17. Did not need prompting
- (Total = 5)**

Communication:

- (1) 18. Introduced self
- (1) 19. Explained task
- (1) 20. Maintained eye contact
- (1) 21. Used open-ended questions
- (1) 22. Avoided medical jargon
- (1) 23. Washed hands
- (1) 24. Draped appropriately
- (Total = 7)**

Preparation for Physical Examination:

- (1) yes/no
- (1) yes/no

Breast Proficiency Score:

- (1) 25. Inspected both breasts: arms relaxed
- (1) 26. Inspected both breasts: arms flexed
- (1) 27. Inspected both breasts: arms raised
- (1) 28. Examined supraclavicular area
- (1) 29. Examined infraclavicular area
- (1) 30. Examined deep central axillary area
- (1) 31. Examined lateral lymph nodes
- (1) 32. Examined pectoral lymph nodes
- (1) 33. Examined subscapular lymph nodes
- (2) 34a. > A cup: Cahan position (with a small pillow or towel under the shoulder) for examining lateral side of breast **OR**
- (2) 34b. ≤ A cup: supine for examining lateral side of breast
- (2) 35. Supine for medial
- (1) 36. Used light pressure
- (1) 37. Used medium pressure
- (2) 38. Used deep pressure
- (3) 39. Palpated in small circles (dime size)
- (3) 40. Used pads of fingers
- (1) 41. Used three fingers (or two large fingers)
- (2) 42. Used one second per motion
- (3) 43a. Used vertical strip pattern **OR**
- (2) 43b. Systemic, nonvertical strip
- (1) 44. Nipple compression
- (6) 45a. Examined entire chest area **OR**
- (4) 45b. Examined cone only
- (Total = 36)**

Comments: _____

Figure 3. Instrument to Assess Performance Examination

Note. Numbers in parentheses before each item are for the benefit of the reader to see the weighting and did not appear on the form, rather, the form had a bubble beside each item to be filled in if that task was completed by the healthcare provider.

not all participants were available to complete all instruments. In the intervention counties in the north, 55 participants completed one instrument, 53 completed two instruments, 26 completed three instruments, and 16 completed all four instruments. In the comparison counties in the south, 18 participants completed one instrument, 32 completed two instruments, 3 completed three instruments, and 21 completed all four instruments. All available data were used in the analysis. No significant differences existed be-

tween the intervention and comparison groups in participant age, gender, race, or type of nurse licensure or physician specialty.

Healthcare professionals scored fairly high on the pretest surveys (6.7 out of 8, SD = 1.4) on measures of agreement with breast cancer screening guidelines, self-reported screening behaviors, and beliefs related to the importance of breast cancer screening practices. However, they failed to demonstrate adequate breast cancer screening behaviors during the objective performance pretest. The objective performance pretest scores had the following characteristics: risk screening ($\bar{X}$ = 4.1, SD = 3.6, maximum possible score = 12), screening advice ($\bar{X}$ = 2.2, SD = 1.6, maximum possible score = 5), and CBE ($\bar{X}$ = 16.4, SD = 11.2, maximum possible score = 36). None of these performance scores correlated with knowledge and beliefs (r = 0.07–0.13).

An analysis, using a paired t test, of pretest/post-test matched scores for the performance examination showed that, overall, the healthcare providers significantly improved in their demonstration of breast cancer screening practice, as

Table 1. Numbers of Participating Healthcare Providers

Healthcare Professional	Intervention Group	Comparison Group	Total
Physicians	29	32	61
Nurses	113	30	143
Mammography technicians	8	12	20
Totals	150	74	224

observed and scored by the standardized patients, after participating in the intervention ($t = 4.3$, $p < 0.0001$, power = 0.99). Although all providers showed improvement, no difference in performance was found between the intervention and comparison counties prior to the delayed intervention with the comparison group. The nurses performed significantly better than the physicians on the actual CBE during the post-test (nurses $\bar{X} = 12.0$ [SD = 13.2] versus (physicians $\bar{X} = 8.7$ [SD = 11.9], $p = 0.014$).

Figures 4 and 5 show results of a comparison of the percentage of women by age group receiving mammograms in the intervention and comparison counties before and after the intervention in the north. A significant difference was found between the north and south before the intervention: A lower percentage of the women age 60 and older in the north were receiving mammograms (chi-square = 38.3, $df = 5$, $p < 0.001$). However, after the intervention, no differences existed, indicating that an appropriate shift had occurred in the percentage of women by age groups receiving mammograms in the intervention counties. Also, an increased percentage of women in the higher-risk age groups (older than 50) received screening mammography in the north. Table 2 shows that a higher percentage of African American women than Caucasian women received their first mammogram and that this difference was greater in the intervention group.

Participating healthcare providers rated the posters as excellent on a scale of excellent to poor, indicating that the visuals were of good quality and helped to clarify content. They rated the newsletters as helpful.

Another part of the multidimensional intervention was to distribute lay literature to the healthcare providers to give to their patients. Although the researchers chose the most appropriate lay literature from their review of 61 publications from 19 agencies, the lay literature did not completely meet their criteria. The criteria stated that the literature had to be appropriate for women with low literacy, culturally sensitive and appealing to low-income and minority women, and accurate in illustrating correct BSE techniques. Sixty-one documents were examined for readability and cultural sensitivity. The Flesch Reading Ease (FRE), Flesch-Kincaid (F-K), and Cultural Sensitivity Assessment Tools (CSATs) were used in testing. The mean FRE score of 65 yielded a F-K mean grade level of 7.5 (desired level = 3.5). Using CSAT, 16 documents (26%) were eliminated because they had no visuals. Twenty-two publications (37%) were culturally sensitive for all audiences, and 19 (31%) were for Caucasian audiences. Four (6%) pieces specifically addressed African American women. The researchers concluded that printed educational materials about breast cancer do not adequately provide information to undereducated, economically disadvantaged African American women (Mohrmann et al., 2000). Subsequently, the researchers developed and tested a motivational picture book and instructional pamphlet to meet this need (Coleman et al., 2002, 2003).

Discussion

Study Limitations

During the course of this study, the Arkansas Department of Health received funding from the Centers for Disease Control and Prevention to initiate breast cancer screening educa-

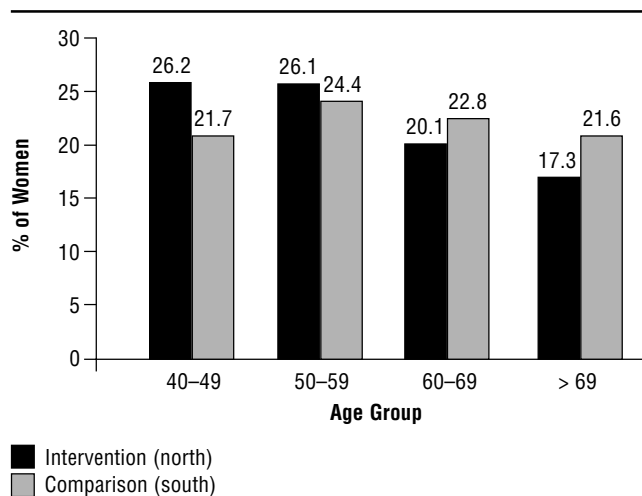


Figure 4. Percentage of Women by Age Group Receiving Mammograms Before Intervention (N = 5,834)

tion programs for all primary healthcare providers in Arkansas and used essentially the same interventions as this study. Therefore, the healthcare providers in both areas had significant improvements in the quality of their performance of CBE (history and physical examination), but no difference was found between the comparison and intervention groups. Survey scores on knowledge, attitude, and stated practice regarding breast cancer screening were high for providers in both groups on the pretest and post-test. Not all participants completed all four instruments, but all available data were used in the analysis.

Mammography facilities' data provided the number of women obtaining mammograms in those facilities by age and race. Some of the mammograms may have been diagnostic rather than screening, and the actual number of women eligible for screening during the data-collection period is not known. Finally, data were not available for the women's socioeconomic status, so these factors could not be considered in the data analysis.

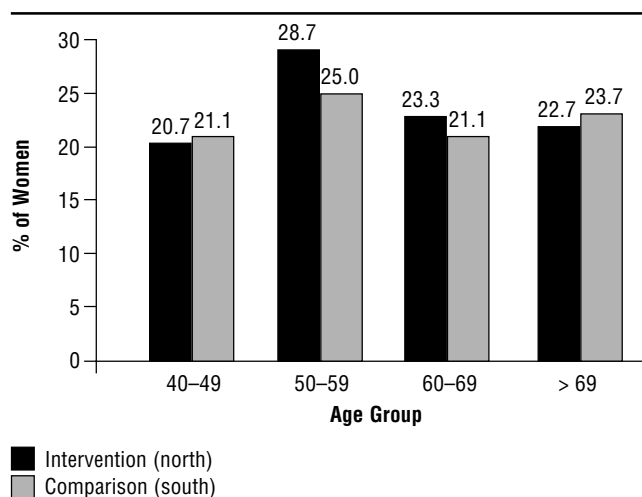


Figure 5. Percentage of Women by Age Group Receiving Mammograms After Intervention (N = 3,411)

Table 2. Percentage of Women Receiving First Mammograms by Race After Intervention

Group	% Caucasian Women (N = 3,029)	% African American Women (N = 696)	p
Overall	11	22	< 0.001
Intervention	13	35	< 0.001
Comparison	13	21	< 0.001

Test Scores

Although providers' pretest survey scores on knowledge, attitudes, and behaviors were relatively high, the objective performance scores on CBE (interview and physical examination) were low, indicating the need to teach healthcare providers CBE techniques. Overall, CBE performance scores improved significantly after the standardized patients taught providers how to perform CBE. However, the post-test revealed no significant differences between the intervention and comparison groups. During the study, the state received funding from the Centers for Disease Control and Prevention for a statewide breast cancer screening program targeting all women. The Arkansas Department of Health administering the Centers for Disease Control and Prevention program used this study's methods, such as standardized patients teaching healthcare providers in their clinics, in counties other than this study area, throughout the state. The resulting efforts of this program probably affected outcomes in the study areas. For example, the Arkansas Department of Health offered statewide workshops on breast cancer screening for healthcare providers and provided mammography at no cost for Arkansas women with low incomes. The researchers were encouraged to see that breast cancer screening improved.

Analysis of the mammography facilities' survey data indicated that significantly more elderly women received a mammogram and more African American women received a first-time mammogram in the intervention group of counties than in the comparison group after the intervention. Some of these mammograms may have been diagnostic rather than screening. However, because the proportion of each in the different collection time periods probably would be about the same, this should not affect the overall results.

Successful interventions included the use of standardized patients to observe and record healthcare professionals' performances, followed by direct feedback. Costanza et al. (1999) also found that using standardized patients to provide small group training and in-office evaluation improved community physicians' skills in mammography counseling and CBE.

Paskett et al. (1999) successfully used chart reminders, examination room prompts, in-service meetings, and patient-directed literature to improve breast cancer screening. In this study, the posters in examination rooms, laminated pocket cards, and newsletter informing healthcare providers about educating patients about screening methods proved to be successful. In implementing this study, based on a review of the available lay literature, the researchers identified the need for culturally sensitive, well-illustrated, easy-to-understand lay literature (Mohrmann et al., 2000).

Conclusion and Recommendations

Physicians play a powerful role in motivating women to have mammograms and CBE and to practice BSE as recommended. Interventions that help these providers fulfill that role should be implemented.

The PRECEDE-PROCEED Model was helpful in planning, implementing, and evaluating the interventions used in this study. For the healthcare providers, information from the survey guided the specific items that the standardized patients and researchers used to provide reinforcing education on breast cancer screening. For example, if a healthcare provider was not aware of the current screening guidelines, they were discussed. The individualized instruction about CBE served as an enabling factor to change the healthcare provider's behavior as it related to providing breast cancer screening for the female patients in their practice. Environmental factors were considered when the decision was made to take the educational program to the healthcare providers in their practice settings. Having a standardized patient deliver CBE teaching individually to each healthcare provider in his or her examination room was less threatening.

Multimethod interventions targeted at primary care providers are needed to improve breast cancer screening for women who see these providers. Successful approaches in rural settings may include the use of standardized patients to teach healthcare providers in their office settings, prompts such as posters and pocket cards that serve as reminders for patients and healthcare providers, and newsletters that provide useful information in an easy-to-read format.

If resources are not large enough to target all healthcare providers, prioritizing may be necessary. Targeting healthcare providers who are least adherent to breast cancer screening recommendations (Lane & Messina, 1999) (e.g., family practice physicians [Coleman et al., 2001; Frame, 2000]) may yield the greatest benefit. Alternatively, targeting nurse practitioners because they are more successful in persuading African American women of low income to keep mammography appointments may be even more effective (Crump, Mayberry, Taylor, Barefield, & Thomas, 2000).

Novel approaches such as including breast cancer screening as a part of community-based influenza clinics (Shenson, Cassarino, & DiMartino, 2001) should be tested. Repeat screening is important, and associated factors should be studied. Women who do not adhere strictly to screening mammography recommendations are less likely to have an annual CBE than those with strict adherence to the guidelines. They often are ambivalent about screening mammography and confused about screening guidelines. These women are less likely to be advised by a physician about mammography, perceive their breast cancer risk as lower, and are less likely to be up-to-date with other cancer-screening tests (Halabi et al., 2000). Appropriate lay literature is needed (Mohrmann et al., 2000). Finally, reliable methods of ascertaining compliance with breast cancer screening should be used in determining the efficacy of interventions targeting healthcare providers (Kim et al., 1999).

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For more information . . .

- National Alliance of Breast Cancer Organizations
www.nabco.org
- The Susan G. Komen Breast Cancer Foundation
www.komen.org
- Y-ME National Breast Cancer Organization
www.y-me.org

Links can be found using ONS Online at www.ons.org.