

Reducing Breast Cancer Screening Barriers Among Underserved Women in South Dallas

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ABSTRACT

Objective: To identify breast cancer screening barriers in an underserved population and evaluate the changes in barriers and knowledge that result from attending a breast cancer prevention program. Participants: Medically underserved women, age 40 or older, residing in South Dallas, Texas, who were eligible to receive a screening mammogram and had no personal history of cancer.

Methods: Participants attended an 8-week program on breast cancer prevention, early detection, and overall healthy lifestyle education. Women were also invited to receive a screening mammogram. Pre- and post-surveys were administered to collect information, including breast cancer screening knowledge, attitudes, barriers, access to health care, and self-efficacy.

Results: At baseline (N = 430), women reported an average of 2.8 (standard error 0.12) breast cancer screening barriers. The most commonly reported barrier was “I am not aware of any free or reduced-cost resources in my community where I can get a mammogram” (47%). For each previous breast cancer screening behavior (mammogram, self-exam, clinical exam), significantly greater barriers were reported among women who reported no screening. After adjustment, the odds of ever having a mammogram decreased by 14% for each additional barrier (OR: 0.86 [95% CI: 0.79-0.95]). Total barriers were reduced from 2.7 (0.16) at baseline to 1.7 (0.13) (p<0.01) at follow-up. Total knowledge increased from 5.0 (0.08) to 5.7 (0.08) (p<0.01) pre- to post-program. In total 185 women received a mammogram at some time during the 2-year prevention program.

Conclusions: Awareness, cost, availability, and transportation are major factors hindering this population from receiving a screening mammogram. After participating in a breast cancer prevention program, women reported a smaller number of barriers and greater knowledge about breast cancer. More importantly, the most common barriers reported at baseline were reduced through this prevention program.

INTRODUCTION

Breast cancer is the most common female [non-skin] cancer, and the second leading cause of cancer death in women in the United States.^{1,2} In spite of progress in screening mammography practices in the general population, lower screening rates are observed in several sub-groups of women in the United States.^{1,3-6} Breast cancer screening barriers, including personal and system-level barriers, have been inversely associated with screening rates.⁷⁻²¹ Personal barriers are the psychological factors that hinder making a decision to obtain mammography. System barriers are structural, such as difficulties encountered in accessing the health system for screening mammography, or obstacles related to cost and affordability of a mammogram.^{9,22}

Few attempts have been made to identify and remove these barriers in an underserved urban population using a community-based participatory research (CBPR) approach. Therefore, using a CBPR approach, we designed a program to address breast cancer screening

barriers among women living in an underserved area in South Dallas, Texas, an area with high late-stage breast cancer diagnosis and high breast cancer mortality.

POPULATION AND METHODS

The Dallas Cancer Disparities Coalition (DCDC) was created in 2007 through an academic-community partnership to address high cancer mortality rates in South Dallas.²³ The Coalition represents organizations such as nonprofits, neighborhood associations, and hospital systems and is led by a Community Advisory Board, the members of which are co-investigators for all related studies. In 2010, the Coalition was awarded a prevention program grant by the Cancer Prevention and Research Institute of Texas to provide breast health education to women through group classes and to provide mammography services. The prevention program aimed to (1) increase knowledge of the chief factors contributing to breast cancer and steps to reduce breast cancer risk, and (2) increase breast cancer screening practices. The program was modeled after two community-based research tested interventions, and resulted from a breast cancer prevention pilot study in South Dallas.²³ Additionally, based on the needs of this population and barriers identified by focus groups held prior to the pilot study, two theories helped to guide the program; the Health Belief Model and Social Cognitive Theory. The program consisted of eight breast health education classes (each 1.5 hours), held weekly in community locations, including YMCAs, schools, neighborhood centers, and senior living facilities. Over the 2-year program, we held nine different cycles of the 8-week program. Class size per cycle varied from 26 to 63. The classes covered primary and secondary prevention of breast cancer, including facts about and risk factors for breast cancer, methods of early detection, how to talk to your doctor and how to eat healthy on a budget. The program curriculum used in this study was developed by investigators in collaboration with the Community Advisory Board and was first implemented in the pilot study.²³ The program specifically addressed barriers related to awareness and access of local reduced-cost mammography screening sites. The program also taught participants what to expect during the mammogram. Participants received a \$10 gift card for completing each session, and another \$10 gift card was offered for completion of each of two surveys, one prior to the first class and one at the end of the program. Weekly door prizes were offered for those participants who returned their homework assignment and incentives were given for perfect attendance. Transportation was provided to participants, and each woman was encouraged to receive a screening mammogram during the program. If a screening mammogram indicated the need for further diagnostic work-up, lay health educators acted as patient navigators to assist participants in obtaining further diagnostic services. Participants needing follow-up treatment were linked with local health care systems in the Dallas area.

Participating women had to be age 40 and older, eligible to receive a screening mammogram (i.e., 1 or more years since their last mammogram, and not symptomatic), speak English or Spanish, have no personal history of cancer, and reside in South Dallas (zip codes 75210, 75215, and 75223). Lay health educators were responsible

for recruitment and retention, coordinating the sessions, and providing one-on-one communication with participants between the group sessions. Although the program cycles were conducted in several different locations, the lay health educators followed structured materials that were used in all sessions, in order to maintain program fidelity. They also scheduled mammograms and assisted the women in navigating various healthcare systems and follow-up medical visits. Participants completed a 30-minute verbally-administered survey, prior to the program and again at completion, that assessed their knowledge of breast cancer and previous receipt of breast cancer screening. Other factors measured included psychosocial characteristics of participants, including self-efficacy, health behavior and sociodemographic characteristics. Breast cancer screening barriers were identified by 15 individual questions adapted from Paskett et al.²⁴ For each barrier question, a response of “yes” indicated a screening barrier. Knowledge items were measured by seven questions modified from existing scales.^{25,26} Each question had a correct response of “true” or “false”. The barriers and knowledge questions were modified from existing scales based on feedback from the target population. No factor analysis was conducted on the modified questions; however they were implemented in the pilot study in South Dallas.²³ Previous breast cancer screening behaviors were assessed by three questions: “have you ever had a mammogram,” “have you performed breast self-examination in the last month,” and “have you had a clinical breast examination in the previous year?” Response

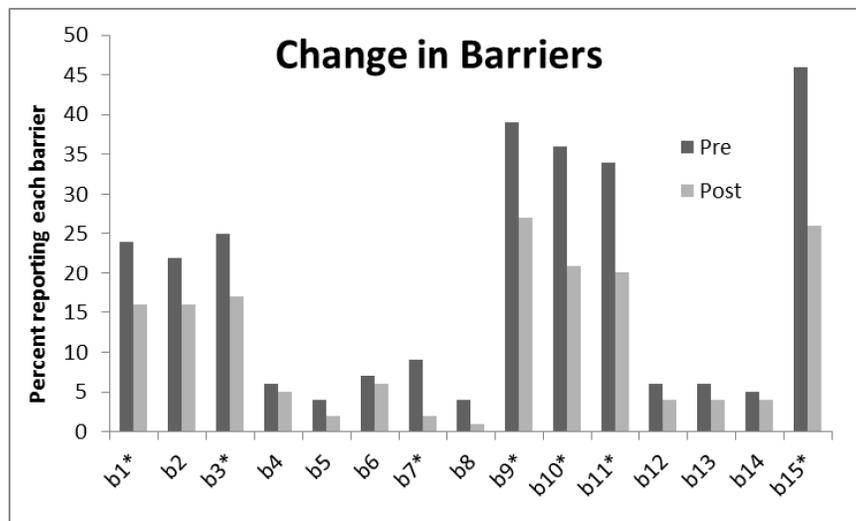
options were “yes,” “no,” or “don’t know.” A response of “no” or “don’t know” was categorized as the absence of the screening behavior.

Frequency and percentage distributions were calculated for participant demographic characteristics. At baseline, frequencies were calculated for individual barrier items, and summed to compute total barriers. Multiple t-tests were used to test for associations between previous screening behaviors and the mean number of baseline barriers. Crude and adjusted logistic regression were also used to test the association between previous screening behaviors and total number of barriers, controlling for variables associated with screening (age, health insurance, income, marital status, and personal medical doctor). Separate sub-analyses were conducted on individuals who completed both the pre- and post-surveys for barriers and knowledge. Change in individual barriers from pre to post was assessed with the McNemar test. Change in total barriers, and change in total knowledge, was evaluated with paired t-tests. The percentage of participants reporting each barrier at pre and post was displayed in a Figure 1.

RESULTS

Demographic characteristics of the 430 individuals who consented and completed the baseline survey are shown in Table 1. Participants’ ages ranged from 40 to 91, with a mean age of 53.2 (standard de-

Figure 1. South Dallas Breast Cancer Prevention Program Participant-Reported Barriers to Screening Mammography Receipt, Pre- and Post-Program



*p < 0.05

b1: I am afraid to have a mammogram because I might find out something is wrong

b2: I don’t understand what will be done during the mammogram

b3: I don’t know how to go about getting a mammogram

b4: Having a mammogram is embarrassing

b5: Having a mammogram takes too much time

b6: Having a mammogram exposes me to unnecessary radiation

b7: I have other problems more important than getting a mammogram

b8: I am too old to need a routine mammogram

b9: I cannot afford to get a mammogram

b10: I cannot get transportation to get a mammogram

b11: There are no places close to me where I can get a mammogram

b12: Lack of privacy during the x-ray bothers me

b13: Exposing my breast during the test bothers me

b14: The closeness of the x-ray staff during the test bothers me

b15: I am not aware of any free or reduced-cost resources in my community where I can get a mammogram

viation 9.1). Almost all participants were African American (93%), and most (70%) reported a family income below \$10,000. On average, participants reported 2.8 barriers (standard error 0.12, max of 15) (Table 2). The most frequently reported screening barrier among participants (47%) was “I am not aware of any free or reduced-cost resources in my community where I can get a mammogram.” Other top-rated barriers included, “I cannot afford to get a mammogram” (40%), “there are no places close to me where I can get a mammogram” (36%), and “I cannot get transportation to get a mammogram” (35%).

There was a statistically significant association between total number of barriers and previous screening behavior (Table 3). For each screening behavior, those who reported “no” also reported a greater number of barriers. Among women who reported never having a mammogram, the mean number of barriers was 3.6 (standard error 0.23), compared to 2.4 (0.14) barriers among women who had undergone mammography screening in the past ($p < 0.01$). A similar association was observed for breast self-examination in the last month ($p < 0.01$), and clinical breast examination in the last year ($p < 0.01$).

Aside from barriers, other variables including age, health insurance,

income, marital status, and having a personal medical doctor were significantly associated with previous screening behavior. To account for this, we performed multiple logistic regression (Table 4). Even after adjustment, there was a significant association between screening barriers and all three previous screening behaviors. For example, the odds of ever having a mammogram were decreased by 14% for each additional barrier (OR: 0.86 [95% CI: 0.79-0.95]), after adjustment. Similar associations were found for breast self-examination (OR: 0.88 [95% CI: 0.81-0.96]) and clinical breast-examination (OR: 0.87 [95% CI: 0.79-0.96]).

There was a statistically significant reduction in barriers among participants who completed the pre- and post-survey (N=244) (Figure 1). At baseline, the average number of barriers reported was 2.7 (standard error 0.16), compared to 1.7 (0.13) at the post survey ($p < 0.01$). The percentage reporting individual barriers also decreased from pre to post. Significant decreases ($p < 0.05$) were observed in multiple barriers. Finally, overall knowledge increased from the pre- to post-survey among participants who completed both (N = 243). The baseline knowledge score was 5.0 (0.08), and at post-survey knowledge was 5.7 (0.08) ($p < 0.01$).

Table 1. South Dallas Breast Cancer Prevention Program Participant Characteristics, 2010-2012 (N = 430)

Characteristic	n (%)
Age	
40 - 49	164 (38)
50 - 64	222 (52)
65 - 74	27 (6)
≥75	16 (4)
Missing	1
Race	
African American	393 (93)
White	12 (3)
Other	16 (4)
Missing or refused	9
Income	
<\$10,000	297 (70)
\$10,000-\$20,000	78 (18)
≥\$20,000	49 (12)
Refused	6
Education	
≤11 th grade	155 (36)
Grade 12 or GED	179 (42)
Some college or higher	95 (22)
Missing	1
Marital status	
Married	74 (17)
Never married	101 (24)
Other	252 (59)
Missing or refused	3
Health insurance	
No health insurance	156 (37)
Has health insurance	269 (63)
Don't know	5
Having a personal medical doctor	
No	199 (46)
Yes	231 (54)

Table 2. South Dallas Breast Cancer Prevention Program Screening Barriers at Baseline

Barrier	n (%)
I am not aware of any free or reduced-cost resources in my community where I can get a mammogram	202 (47)
I cannot afford to get a mammogram	171 (40)
There are no places close to me where I can get a mammogram	155 (36)
I cannot get transportation to get a mammogram	150 (35)
I don't know how to go about getting a mammogram	116 (27)
I don't understand what will be done during the mammogram	113 (26)
I am afraid to have a mammogram because I might find out something is wrong	102 (24)
Exposing my breast during the test bothers me	35 (8)
Lack of privacy during the x-ray bothers me	32 (7)
Having a mammogram exposes me to unnecessary radiation	31 (7)
I have other problems more important than getting a mammogram	26 (6)
The closeness of the x-ray staff during the test bothers me	25 (6)
Having a mammogram is embarrassing	23 (5)
I am too old to need a routine mammogram	13 (3)
Having a mammogram takes too much time	12 (3)
<i>Total</i> (mean, standard error) (N = 426)	2.80 (0.12)

Table 3. Baseline Association between Screening Barriers and Previous Breast Cancer Screening Behaviors

	Barriers Mean (standard error)	P-value
Mammogram ^a		<0.01
Yes (n = 296)	2.4 (0.14)	
No (n = 129)	3.6 (0.23)	
Self-exam ^b		<0.01
Yes (n = 194)	2.3 (0.15)	
No / don't know (n = 231)	3.2 (0.18)	
Clinical exam ^c		<0.01
Yes (n = 157)	2.2 (0.17)	
No / don't know (n = 269)	3.2 (0.16)	

^aHave you ever had a mammogram?

^bHave you performed a breast self-examination in the last month?

^cHave you had a clinical breast examination in the previous year?

Table 4. Association between Baseline Screening Barriers and Previous Screening Behaviors (baseline total barriers is the independent variable in each model)

Dependent variable	Crude Odds Ratio (95% CI)	Adjusted Odds Ratio ^d (95% CI)
Mammogram ^a	0.83 (0.76 – 0.90)	0.86 (0.79 – 0.95)
Breast self-examination ^b	0.85 (0.78 – 0.92)	0.88 (0.81 – 0.96)
Clinical breast examination ^c	0.84 (0.77 – 0.92)	0.87 (0.79 – 0.96)

^aHave you ever had a mammogram? Adjusted for age, health insurance, income, marital status, and personal medical doctor.

^bHave you performed a breast self-examination in the last month? Adjusted for health insurance, income, personal medical doctor.

^cHave you had a clinical breast examination in the previous year? Adjusted for education, health insurance, personal medical doctor.

^dAdjusted for age, health insurance, income, marital status, and having a personal medical doctor

DISCUSSION

In this study of underserved women, economic and structural barriers to breast cancer screening were commonly reported, including the cost of mammography, poor awareness of free or reduced-cost facilities, poor geographic access, and lack of transportation to mammography sites. Women reporting a higher number of barriers were less likely to report previous screening mammography. Following the intervention, there was a significant increase in breast cancer knowledge and a reduction in the average number of barriers reported by the participants, as well as a reduction in the proportion of participants reporting each barrier.

Previous studies of underserved women, or women who underutilize mammography, reported cost and distance as common barriers to receiving mammography.^{11, 27} However, even when mammography facilities are available and conveniently located, and even after taking economic barriers into consideration, structural barriers relating to access, awareness of mammography facilities, and the sociocultural contexts of women may be important factors affecting mammography utilization.²⁷⁻²⁹ The multifaceted nature of our prevention program took into account the sociocultural contexts of participants and addressed some of the barriers that have been commonly reported in the literature, including transportation and cost of mammography. Lay health educators helped participants navigate the local health care system to schedule mammograms and transported them to mammography sites. If participants required follow-up diagnostic testing, the lay health educators assisted them with the process. This approach and our findings suggest that prevention education programs that target multiple dimensions of barriers may be successful in decreasing barriers and increasing mammography in underserved women.

One limitation to the interpretation of our study findings is that the reductions in these barriers are not necessarily indicative of improved mammogram screening rates. Women were able to receive a mammogram during the program, and didn't have to wait until they completed it. We therefore cannot determine whether or not reduction in barriers was causally associated with mammography screening. However, studies have shown that having fewer barriers is predictive of higher mammography rates. Another limitation is that the scales we used to measure barriers and knowledge were modified from other studies; their reliability and validity are therefore not fully known. Finally, there were nine total cycles of the 8-week program. There may have been slight differences in program implementation that are not accounted for in this analysis. The participant retention rate from pre- to post-surveys was 57%. In spite of these limitations, our study has several strengths. First, our study population was comprised of underserved women in an urban area, most of whom were African American, a historically understudied population for breast cancer prevention. Second, this study was conducted using a community-based participatory approach, which has created a network of businesses, community leaders, and participants working together to bring breast cancer prevention to an underserved population.

CONCLUSION

The breast cancer prevention program among underserved women in South Dallas was successful at reducing self-reported barriers and increasing knowledge among participants. These changes may ultimately lead to reduce cancer health disparities among underserved women. The Coalition's long-term goal is to create sustainable cancer prevention models that can be replicated in other parts of Texas in similar communities to reduce breast cancer disparities.

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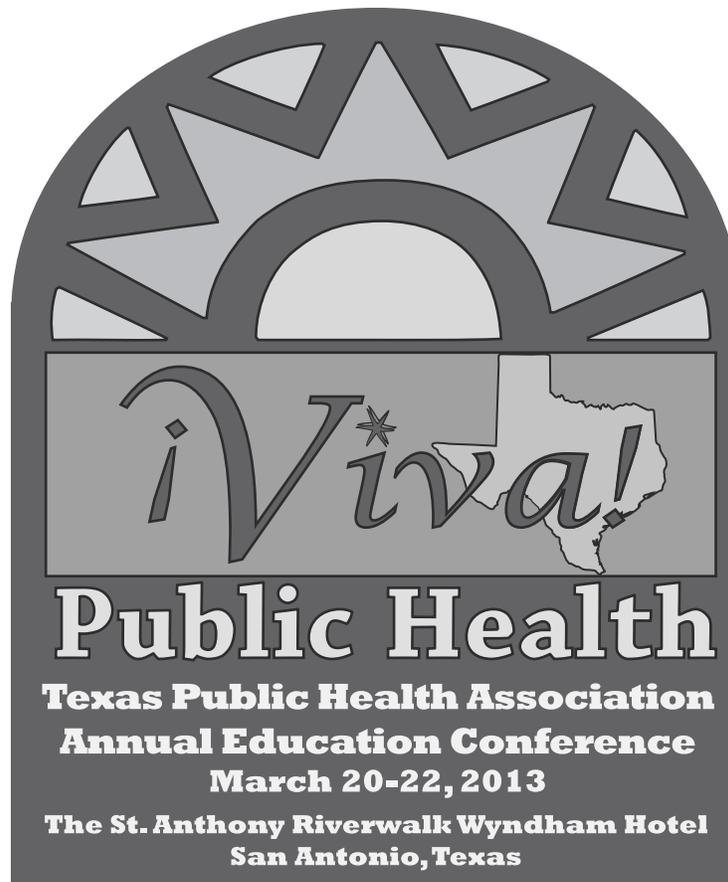
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