

## Comparison of three interventions to increase mammography screening in low income African American women

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Accepted 10 October 2006

### Abstract

**Background:** Low-income African American women are more likely to die of breast cancer than their Caucasian counterparts, and at least part of the difference in mortality results from differential screening adherence. The purpose of this study was to identify more efficacious methods of promoting routine mammography screening in underserved populations. **Methods:** A prospective randomized intervention study of 344 low income African American women compared the impact of three interventions on mammography adherence and stage of readiness: (1) pamphlet only; (2) culturally appropriate video; and (3) interactive computer-assisted instruction program. **Results:** The interactive computer intervention produced the greatest level of adherence to mammography (40.0%) compared to the video group (24.6%) and the pamphlet group (32.1%). When subjects in the pamphlet and video groups were combined to form a non-interactive group, this group had a significantly lower adherence than the group who received the interactive computer intervention (27.0% versus 40.0%). There was also significantly more forward movement in mammography stage of readiness among participants in the computer group (52.0%) compared to those in the pamphlet group (46.4%) or the video group (31.3%). When combining the non-interactive technology (pamphlet and video) there was also more forward movement in mammography stage of readiness for those in the interactive intervention group (52.0% moved 1 or 2 stages) compared to those in the non-interactive group (36.2%). **Conclusions:** These data indicate that tailored approaches are more effective than targeted messages either in print or video format. Another finding of this study is that interactive interventions are more effective than non-interactive interventions in increasing adherence and moving African American women forward in their mammogram stage of readiness. © 2006 Published by Elsevier Ltd on behalf of International Society for Preventive Oncology.

**Keywords:** Early Diagnosis; Breast Cancer; Screening; Mammography; Early detection; Interactive computer-assisted instruction program; Culturally appropriate video; Tailored intervention; Perceived benefits; Perceived barriers; Adherence; Self efficacy; Fear

### 1. Introduction

Breast cancer continues to be a major cause of mortality for African American women, ranking as the second leading cause of cancer death within this population [1]. Low

income African American women are at especially high risk for breast cancer mortality due in part to their limited mammography use [2]. Five-year breast cancer survival for Caucasians is 89%, while for low income African Americans it is only 75%. Research during the last 30 years with eight major randomized trials has demonstrated mortality decreases of up to 30% in women 50 or older who are routinely screened [3–10]. Furthermore, it has been

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estimated that up to one half of the disparity in breast cancer mortality for African American women compared to Caucasian women results from less frequent screening [11].

Although, the last decade has seen increases in mammography screening, African American women still lag behind Caucasian women in screening frequency [2]. It is essential that the most efficacious methods of promoting routine screening among our underserved populations be identified and implemented to decrease the mortality gap for breast cancer between African American and Caucasian women. This paper presents the results of a prospective randomized intervention trial to increase mammography screening in low-income African American women residing in a Midwestern urban area.

### 1.1. Background

Descriptive studies have identified both patient and environmental factors associated with breast cancer screening in low-income African American women. Researchers have found that African American women were less knowledgeable about cancer and available sources of health care than white women even after controlling for their socio-economic status [12]. Fox and colleagues found that belief in the benefit of mammograms and a higher level of education predicted re-screening in a group of low income multiethnic women [13]. Consistent with this finding, fatalism, which is found to be more prevalent in African American women, was found to be inversely related to mammography screening [14]. Finally, although race has been found to influence mammography adherence, the effect of race may be confounded by lower levels of education or income—both of which are associated with race. For instance, Levy-Storms, Bastani, and Reuben (2004) found that women who were at risk for never having a mammogram or for relapse had less than a high school education and income lower than \$20,000, while race was not predictive [15].

Researchers have found differences between African Americans and Caucasians when predicting mammography and in assessing intervention effectiveness. Vadaparampil found that variables in the Health Belief Model were more predictive of mammography in Caucasian women than in African American women [16]. Researchers have also found differences between African American women and white women in their responses to interventions aimed at increasing breast cancer screening. Danigelis found that a one-on-one approach was more effective with white women, whereas a group approach was more effective with African American women [17]. Sung, when implementing culturally appropriate educational interventions among inner-city African American women, reported that intervention effectiveness was less among women who were uninsured and could not pay for a mammogram [18].

Interventions assessing different types of message delivery have had mixed results. Schneider found that

loss-framed messages were effective in increasing mammography rates for Whites and Latinos, but not for African Americans. In contrast, Abood et al. found that loss-framed messages as compared to usual care significantly increased mammography in low-income women after adjusting for race and breast cancer symptoms [19].

Researchers have tried both tailored and targeted interventions to increase mammography screening in African Americans. Targeted messages incorporate common factors among population subgroups when developing interventions to better match the groups' general cultural perspectives and needs, including literacy and presentation style. Cultural targeting, for example, may also include addressing colors and graphics in the background [20]. A church-based intervention was targeted to rural African American women in Alabama using a group education program followed by an in-home visit from a Health Education. Women in the intervention group had significantly more adherence to mammography screening than did the control group [21]. Danigelis et al. reported on an educational program developed to meet the needs of low-income African American women in which education sessions were delivered in groups, and individually by discussing mammography with women at grocery stores, shopping centers and flea markets [22]. There was a significant increase in mammography use for women included in the community area receiving information versus those in an area not receiving information. When comparing an intervention consisting of physician education, mailed educational materials and telephone counseling to a group of 2147 women in North Carolina, an interesting interaction occurred with age, education, race and insurance. The intervention produced a significant effect for women 80 and over, those who were African American, those with less than 9 years of education and those having no supplement to Medicare [23].

Tailored interventions address individual differences in which messages are directed toward a specific person and are based on an assessment of that individual's perceptions and needs. Concepts that could be considered in tailoring include religiosity, collectivism, racial pride, and time perception [20]. Tailored interventions have been delivered by mail and phone and found to be effective in African American women. Skinner and colleagues found that low income African American women who received computer-tailored physician recommendation letters were significantly more likely to have had a mammogram at follow-up than women who received non-tailored letters [24]. A second study, comparing targeted and tailored interventions found that tailored telephone counseling and tailored print messages significantly increased mammography adherence in a group of 773 women, over one half of whom were African American [25]. Champion used tailored in-person messages delivered in the home for low-income African American women. In this randomized prospective intervention trial, the in-person interventions

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