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Developing and Evaluating an Individually-Tailored Intervention to Increase Mammography Adherence among Chinese American women

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Abstract

Background—Breast cancer consistently is the most commonly diagnosed cancer and the second most common cause of cancer mortality among Asian Americans in the U.S. The incidence of breast cancer in Asian American women has been increasing at a much higher rate than that of White women.

Objectives—A randomized control single blind study was conducted comparing the efficacy of an individually-tailored telephone counseling and NCI brochure.

Methods—The sample consisted of 193 Chinese American women with no breast cancer history. The participants were randomly assigned to either intervention or control group. Self-reported data that included demographic variables, knowledge, beliefs, and screening behaviors were collected at baseline and 4 months.

Results—The intervention group had increased screening to 40% compared with 33% for the control group at 4 months; the difference was not statistically significant. When the sub-analyses were performed, the intervention is effective in certain demographic groups (i.e., elderly women age 65 and older and recent immigrants). The study intervention was well accepted by participants and perceived as feasible and culturally appropriate based on process evaluation.

Conclusions—The study also demonstrates the feasibility of recruiting and retaining eligible women to participate, and the results show that both study intervention and printed materials increase awareness of the importance of breast cancer screening and screening behaviors for Chinese American women

Implications for Practice—Oncology nurses and advanced practice nurses can play critical roles on this medically-underserved population that experiences disparities in breast cancer mortality by providing culturally-appropriate counseling to promote screening adherence.

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The cancer burden among Asian Americans is unique; of all racial and ethnic groups in the U.S., only among Asian Americans cancer is the leading cause of death.^{1, 2} Additionally, breast cancer consistently is the most commonly diagnosed cancer and the second most common cause of cancer mortality among Asian Americans in the U.S.^{3, 4}

While Asian Americans have been considered to be at lower risk for breast cancer than other non-Hispanic Whites and African Americans, the incidence of breast cancer in Asian Americans during the past decade has been increasing at a much higher rate.⁵ A recent population-based epidemiologic study has verified that Asian American women experienced a rapid increase in breast cancer incidence, particularly among U.S.-born Asian American women younger than 45 years old.⁶ Data from California Cancer Registry indicates that among six Asian-ethnic populations, foreign-born Asian American women had consistently more advanced breast cancer at diagnosis and consequently, lower survival rates than their U.S.-born counterparts.⁶ Migrant studies have shown that breast cancer risk increases in women who move from countries with low incidence rates to countries with high incidence; Asian American women born in the West had a breast cancer risk 60% higher than Asian American women born in the East.⁷

Evidence suggests that the disparity in the late-stage diagnosis and poor survival of breast cancer is associated with utilization of mammography. Numerous uncontrolled trials and retrospective series have documented the ability of mammography to diagnose small early-stage breast cancers which have favorable clinical outcomes.⁸ In addition, more recent data from screening programs in Sweden and Canada demonstrate that 40% of deaths due to breast cancer were prevented in patients who obtained regular mammography screenings.⁹ Although the United States Preventive Services Task Force (USPSTF, 2009) recommended biennial instead of annual mammography screening for women aged 50 to 74 years instead of yearly mammography screening and start mammography screening at the age of 50, several medical authorities such as the American Cancer Society and the American College of Obstetricians and Gynecologists (ACOG) continue to recommend that mammography screening be offered annually to women beginning at age 40.

The American Cancer Society annual report shows that minority and immigrant women underutilize mammography screening.¹⁰ According to the California Health Interview Survey, White, African and Latina women have met the national objective of having a mammogram in the past two years (70% or higher), while Asian American women still lag behind (67.2%).¹¹ State-wide and local data also verify the under-utilization pattern in mammography screening among Asian American women.^{12, 13}

Chinese American Women and Breast Cancer Screening

Breast cancer is the leading cancer for Chinese American women (77.6 per 100,000)¹⁶ and numerous studies report low breast cancer screening rates among Chinese American women. Only 52% of Chinese American women reported having mammograms in the past year in

the California Behavioral Risk Factor Survey,¹⁷ 42% by Su and colleague in Philadelphia (2006),¹⁸ and 53% by Yu & Wu in Michigan (2005).¹⁹

Previous research studies have identified factors associated with the non-adherence to mammography screening among Chinese American women. Acculturation factors such as language, length of residency in the host country, and cultural and logistic barriers are commonly reported to be associated with low utilization of mammographic screening services among Chinese American women.^{20–22} Also, studies report misconceptions and lack of knowledge specific to recommended intervals for mammography screening as factors related to screening adherence.^{23, 24}

Individually-Tailored Intervention

Because promoting cancer screening and early detection have proven to be more difficult in ethnic minority groups,¹⁴ effort is needed to address the special needs of Asian American populations and to determine the appropriateness and efficacy of screening interventions. Tailored interventions, designed to reach an individual based on her unique characteristics have shown promise. Distinct from *targeted* interventions, which are directed at a particular population and involve less personally relevant content, *individually-tailored* interventions deliver messages based on unique characteristics derived from an individual assessment that are unique to that person and are considered personally applicable. The results from a meta-analysis showed the evidence of tailored intervention for promoting mammography screening because health messages tailored to cognitive and behavioral factors are effective decreasing barriers to mammography screening.¹⁵ To date, fewer cancer-control interventions have been conducted and developed for Asian American women that integrate the concept of the individually-tailored intervention. Therefore, the purpose of this study was to develop and test a tailored intervention for Asian American women.

Theoretical Framework

The Health Belief Model (HBM) provides the foundation to guide the development of intervention strategies in promoting mammography adherence. According to the HBM, four main constructs influence an individual's decisions about whether to take action to prevent, screen for, or control illness. In mammography screening, individuals are more likely to adhere to mammography guidelines if they perceive that they are susceptible to breast cancer (perceived susceptibility) and that breast cancer is a serious disease (perceived seriousness), believe mammography screening will reduce their susceptibility or the severity of breast cancer (perceived benefits), and believe the costs of mammography screening (perceived barriers) are outweighed by the benefits. Self-efficacy was first conceptualized and developed by Bandura and later added to the HBM in 1988 to increase its explanatory power.²⁵ Bandura emphasizes self-efficacy as the belief about an individual's ability to exercise control over a set of skills to complete a specific task. In terms of mammography screening, individuals require a set of skills to perform this behavior; for example, in some cases, women may need to locate and contact mammography centers and schedule an appointment after physicians order for obtaining a mammogram. Perceived seriousness was not included as intervening variable in current study. The decision was based on previous findings that there is no variance with the level of seriousness in breast cancer among

Chinese women due to the fact that Chinese women may have considered it a serious condition (as ceiling effect).¹⁹ In terms of susceptibility, findings from the previous focus groups suggested that when these women immigrate to the U.S., they need to be educated about breast cancer risk and current recommendation guidelines for mammography screening.^{19, 20}

Tailored interventions that are designed to reach an individual based on his/her unique characteristics have shown effectiveness in promoting mammography screening; however, such modality has not been tested in Asian or Chinese American women. The current study aims to implement and evaluate an individually-tailored intervention developed for Chinese American women in addressing characteristics such as ethnicity, attitudes, misconceptions and barriers toward breast cancer screening. The tailoring vehicle (via telephone counseling) with interactive features allows for the delivery of individualized messages that address each individual's specific cultural beliefs and attitudes that have been associated with participant's screening behavior.

Methods

Sample and Setting

The study used prospective randomized controlled trial with two groups of Chinese American women to test the feasibility and efficacy of the proposed intervention designed to improve mammography. Following subject recruitment and obtaining the baseline assessment, eligible women were randomized to receive either (1) an interactive, individually-tailored telephone counseling intervention (intervention group), or (2) the control condition. Eligibility criteria included: 1) self-identification as either Chinese or Taiwanese Americans, 2) are age 41 and older; 3) not had a mammogram within the past 15 months; 4) never been diagnosed with breast cancer; and 5) can read and speak English or Chinese. Two community coordinators who were integrated into the Chinese community attended community events and meetings and local English as Second Language (ESL) classes offered particularly for Chinese to recruit potential participants. The community coordinators gave short presentations in Mandarin or Cantonese (available in presenting in English when requested) to provide information about the study purpose and procedures and to recruit potential study participants. One community coordinator is a well-known radio speaker who also went to several radio shows to make short announcements. Study flyers with announcements about the study were distributed to Chinese organizations and community centers and posted at local ethnic grocery stores, restaurants, beauty salons, and churches/temples. Women who were interested in the study provided their contact information for the study team to conduct eligibility screening and baseline interviews.

During the 19-month recruitment period (from March 2010 to July 2011), the project team approached 632 women. Of them, 292 were identified as meeting study eligibility criteria. A total of 193 consented to participate and enrolled in the study (response rate of 66%); among them, 96 were randomized to the intervention group (individually-tailored telephone counseling) and 97 to the control group (who received the NCI mammography brochure). Ninety-five percent of the women (n=187) completed the baseline surveys and 91% (n=167) completed the 4 month follow-up survey.

Intervention Development

A health communications firm worked closely with the research team to develop a Web-based, individually-tailored program for the telephone counseling component. The development process included the following steps: 1) Application (computer program) functionality and parameters were specified based on counseling objectives and usability requirements. 2) Application flow and content were outlined to specify the progression of the counseling call and the areas of content to be included in each call. 3) An application concept was produced with a set of interface designs and a partially functioning application. 4) The assessment questionnaire, individually tailored messages, and message selection algorithms were finalized. A group of women ($n = 6$) who meet the study eligibility criteria participated in a field test to identify and correct any items that might be missing or inappropriate from the original message pool and to evaluate appropriateness, usefulness, clarity, and acceptability of the messages, and ensure accurate translation of messages into Chinese. An eight-member Advisory Board (consisting of two medical professionals, two survivors, two researchers in cancer control, and two community health leaders with backgrounds in Chinese culture) meetings were convened to discuss the results from the field-testing and provide recommendations to the research team. During the meetings, the board members reviewed the scripts of messages and provided suggestions on wording revision to ensure the accuracy and appropriateness. Their feedback was used to finalize the messages prior to intervention delivery. 5) A preliminary application was programmed to be fully functional and tested by the research team staff for functionality and accuracy. 6) A feasibility study tested the full application with 20 eligible participants to ensure the intervention was delivered successfully; any accessibility or usability issues were identified and fixed before full implementation. The final intervention content was revised in an iterative fashion and finalized based on three sources: a) field-testing key messages with members of the target community, b) feedback from the advisory board (both in Step 4), and c) feasibility pilot study of the full application (in Step 6).

Procedure

The study protocol was reviewed and approved by the Institutional Review Board. After screening for eligibility among potential participants and obtaining consent, the research staff conducted the baseline surveys using the Computer Assisted Telephone Interviewing (CATI) system. The study team consisted of two senior investigators whose specialty in cancer control intervention and cancer screening disparities in Asian American women and consultants in Psychology, Oncology Nursing and Statistics. The staff who conducted interviews were individuals who had at least a Bachelor Degree in health-related field and completed a 2-day intensive training.

Participants were randomized either to the tailored telephone intervention or to the control condition. The intervention group members received an intervention tailored to the results of their baseline interviews. For example, women with responses of “agree or strongly agree” on barriers items, “disagree or strongly disagree” on benefits and self-efficacy items, or incorrectly answered knowledge items were provided with counseling messages related to those items. Cultural issues specific to Chinese American women on perceived barriers (e.g., modesty, language) and misconception about the risks of breast cancer were assessed at

baseline (using knowledge scale); as results, the counseling content provided individualized messages that are pertinent to the individual participant based on her responses at baseline assessment. For example, if a woman identified her personal barriers as not being comfortable with a male practitioner during mammography screening and doesn't know where to go for a mammogram, specific messages were provided to her addressing facilities staffed by female professionals and the locations of mammography screening facilities. The control group received a mammography pamphlet on breast health developed by the National Cancer Institute (NCI). The NCI brochure explains the procedure of mammography and the importance of early detection through mammography. Both groups received assessments at baseline and at four-month follow-up; at both points, data were collected through structured telephone interviews, and each interview lasted approximately 20–30 minutes whereas the intervention phone calls could have lasted up to one hour. All the interviews and telephone interventions were conducted in Mandarin, Cantonese, or English. The participants were given \$30 gift cards as an incentive to participate in the study after completing two phases of telephone interviews (Figure 1).

Instrument

The survey instruments used in this study were developed and validated in previous studies,^{20, 26} and translated into Chinese with standard back translation technique, which included the following subscales: Outcome variables: The outcome variable was measured by self-report of mammography screening behaviors; in addition, participants indicated whether their last mammogram was screening or diagnostic.

Socio-Demographics: Participants' age, marital status, education, income level, and years of immigration to the U.S. were assessed with previously used measures.

Knowledge—A 13-item scale developed by the Principal Investigator were be used to measure the women's knowledge of breast cancer and the risk factors (8 items), and mammography screening guideline recommendations (5 items). An example of an item from the knowledge of breast cancer is, "Do you think a woman who has had ovarian cancer is more likely to get breast cancer?" The responses were constructed as Yes, No or Don't Know. An example from the mammography screening guideline recommendations is "If a woman your age does not have any family history of breast cancer or other types of cancers, how often do you think she should get a routine mammogram?" Responses included every 1–2 year, 3–5 years, never and other. These items were tested in a preliminary study conducted with Chinese, Filipino, and Asian Indian women and the results have shown excellent internal consistency (Cronbach's $\alpha = .88$).²³

Mammography-Related Cognition Variables (Perceived Benefits, Barriers, and Self Efficacy)—Benefits are measured by five items that address the positive aspects of mammography screening, such as finding breast cancer early and decreasing chances of dying; for example, "Having a mammogram will help me to find breast lumps early." Barriers are measured by 15 items that address the negative aspects of mammography screening, such as discomfort, pain, inconvenience, modesty, etc. An example of an item from this subscale is, "It's difficult to find transportation to go for a mammogram". Both

subscales use 4-point Likert-type scale items and were both drawn from previous studies²⁰ and from subsequent qualitative work,²⁷ and the results demonstrated excellent internal consistency with Cronbach's alphas for benefit subscale ranged from .86–.87 and for the barrier subscale from .90–.91.^{19, 28} Construct validity was supported by exploring the factor structure of the instrument using confirmatory factor analysis and testing correlations with mammography compliance.¹⁹ Perceived self-efficacy was measured by the Champion's 10-item measure, self-efficacy for mammography screening, which measures women's perceived ability to obtain a mammogram.²⁹ An example of an item from this subscale is, "You can arrange other things in your life to have a mammogram." The responses use 4-point Likert-type scale (strongly disagree to strongly agree). The subscale demonstrated an internal consistency reliability of .91 and a unidimensional factor structure with all items loaded at .60 or above.³⁰

Intervention Evaluation—Participant's satisfaction toward the intervention was measured using an 18-item process evaluation adopted from Brug and colleague (1993)'s instrument for the telephone session and Champion's current tailored intervention project. The evaluation instrument was translated with standard back translation procedure to assure the reliability during the process. The instrument included 11 structured Likert-type items that assessed whether participants felt the content was appropriate, relevant, thorough, useful, and clear and seven open-ended questions.

Data Management and Analysis

All telephone interview data were entered and double data entry were completed with SPSS software (version 18) to ensure the entered data are correct and as clean as possible. Appropriate scales and subscales were computed prior to data analysis using SPSS. All data files, syntax files (recording computations and data management procedures), and output files were maintained on secure servers. Descriptive statistics including frequency, means, standard deviations, and ranges were used to describe socio-demographic characteristics, screening history, and breast cancer and screening-related knowledge and beliefs.

Power analysis was calculated based on intervention studies in non-Asian American women because effect sizes associated with interventions similar to the current one proposed cannot be found in previous studies of Chinese Americans. At baseline, all participants will be non-compliant according to the eligibility definition. Power for the chi-square test with sample size of 64 per group (total sample size of 128) to detect a difference computed using PASS software indicated a power of 71% to detect this difference with two tailed alpha of .05.

Results

There were no statistically significant differences among the intervention and control groups in terms of demographic variables, health access, and other key cognition, knowledge and previous mammogram intake variables, suggesting that the randomization was successful (Table 1). Most (74%) were between ages of 41 and 65 with a mean age of 54.6 years (SD=9.6) and a range of 41–81. Most (78%) were married and 64% had least at least a high school diploma. Almost half of the women reported an annual household income of less than \$15,000. The study sample consisted of first-generation Chinese American women; more

than half of them (55%) had lived fewer than 10 years in the U.S. (mean length of residency = 12.4 years, SD=9.5, range from 1–48 years). Only 58% of them reported their insurance covered the mammogram. Sixty-seven percent of the women had regular healthcare providers, but only 39% of them reported that they receive recommendations to obtain mammograms from their providers. About one-third (35%) had received their last mammograms one to two years prior to the study, 40% of the participants reported two years and longer, and 25% had never received one in the past.

Evaluation of the individual-tailored intervention

The post-survey was conducted at four months after the baseline survey was performed using 4-point Likert-scale questions and open-ended questions that measure appropriateness, relevance, thoroughness, usefulness, and clarity of the intervention content. The intervention participants rated all the structured Likert-scale items positively with more than 90% of agreement on their responses except one item (Table 2). Overall, the majority of participants reported that the content was appropriate (93%), relevant (85–93%), comprehensive in covering various aspects of breast cancer and screening (92–98%), useful (94–98%), and clear (91%). Eighty-six percent of participants reported that during the telephone call, they received new information about mammography screening that they were not aware of before. One quotation from one of the open-ended questions showed how this individually-tailored telephone counseling benefits the participant, “What a nice intervention, I really appreciate what you’ve done because it will benefit many other women to learn more of what they need to know about getting mammogram. It also corrects the misconceptions what I previously had and gain correct and updated information about mammogram so I won’t continue to distribute the incorrect information to other friends/women. Because of this project, I learn so much about mammogram and now I can be confident to share what I know with others.”

Mammography Utilization at Four-month Post Interviews

At the baseline, all the women reported their last mammograms were taken more than 13 months previously. At the Four-month follow-up interviews, 40% of the women (n=34) in the intervention group compared to 33% of the women in control (n=27) went to obtained mammograms ($\chi(1) = 1.81, p = ns$). It is also noted that more women dropped from first to the follow-up telephone survey in control group (16%) versus 10% in the intervention group.

When sub-analyses were performed on examining the effects between two groups based on insurance status, age group, and the length of residency in the U.S., several interesting trends were found. For example, the results showed that for women with insurance covering mammograms, there was a larger difference in the intervention effect (56% in intervention group vs. 34%, a 22% difference) (Figure 2). The intervention produced larger effects than control print materials based on the length of residing in the U.S.; that is, the results showed the trend that for newer immigrants (i.e., women who stayed in the U.S. 10 years or less), there was a larger difference of intervention effect (Figure 3). In terms of the age effect (Figure 4), the results showed that for older women (age 65 years and older), there was a larger difference of intervention effect (51% in intervention group vs. 25%, a 25%

difference). The Chi-Square analyses did not find significant differences except among for those who have insurance, the difference between intervention and control group is significant [$\chi(1) = 4.98, p = .03$].

Discussion

The Chinese American population is one of the fastest growing populations in the U.S.; nevertheless, mammography screening is lower compared to mainstream populations. Distinct from culturally targeted interventions that are re-directed at a particular population, individually-tailored intervention is designed to deliver messages are more actively processed and considered personally applicable.^{31, 32} A plethora of such studies in the literature were conducted with the evidence on the effectiveness of tailored phone interventions to promote compliance with screening mammography;^{33–37} however, none has been conducted in immigrant Asian American women population. The results presented in this paper are the first to report the efficacy of an individually-tailored intervention designed to promote mammography screening among Chinese American women in the U.S. The study intervention was carefully designed to provide individually-tailored counseling for Chinese American women, an underserved immigrant population with limited English ability and limited knowledge toward breast cancer screening.¹³ Following the guide on the National Cancer Institute, Research-Tested Intervention Program (RTIP), the mammography telephone counseling protocol was divided into two sections: 1) An opening and descriptive section, and 2) A theory-guided counseling program, which was based on Health Belief Model,⁴² first assesses the woman's current state of mammography readiness (perceived benefits, barriers, self-efficacy, and knowledge related to breast cancer screening) and provides appropriate messages including the importance of complying with mammography screening guidelines, information on low-cost/no-cost mammography programs, and strategies to overcome participant's identified barrier(s) to getting a mammogram.

Our randomized trial advances prior research by testing and documenting individual-tailored intervention effects on a group of Chinese American women in the community and was not limited to one health institution.^{34, 38} While identifying immigrant Chinese women who have not been adherent to mammography screening is challenging, recruitment through community liaisons who are connected in the Chinese community represents an important culturally sensitive approach. In current study, we had excellent completion rates at four-month follow-ups (i.e., greater than 90% for both intervention and control group). Majority of participants in our study chose to speak Mandarin or Cantonese when they were on the phone with our study bilingual research staff.

The study results indicate that more women (40%) reported having screening mammograms in the intervention group than in the control group (33%) based on a four-month follow-up interview; the current study findings were slightly higher than another tailored counseling program³⁹ which was designed to promote mammography screening among women in the Los Angeles area (37% in tailored group vs. 29% in control group) and another study⁴⁰ with tailored messages conducted by Advanced Practice Nurses (29% -intervention vs. 21% - control group at 3–6 month follow-up). Similar to Carney and colleague (2005)⁴¹ and Allen & Bazargan-Hejazi (2005)'s study³⁹, the current study found no differences between the

print materials and telephone counseling groups indicating that both interventions had an effect. Following a print intervention, Maxwell and colleague (2008) found the 38% of Korean women received a mammogram screening compared to 32% in the comparison period, whereas no intervention was implemented.⁴³ For the women in our control group, the experience of being assessed on study variables at the baseline and receiving a NCI-printed mammogram brochure in Chinese seems to have prompted these women to obtain mammography screening. The current study findings also pointed out that the intervention may be more effective in certain demographic groups (for example, elderly women age 65 and older and recent immigrants who have immigrated to the U.S. for fewer than 10 years), and the screening rate between the study intervention and the control group was only 10 percentage points higher in the intervention group. The tailored telephone counseling provides more detailed information about screening recommendations specific to participants' characteristics (for example, being older and immigrants) than the standard mammogram brochure. Nevertheless, there were only 13–15% of study sample in the age 65 and older groups for both intervention and control; therefore, future studies with a larger sample size will help to better understand best-practice strategies to promote adherence of mammography compliance to those immigrant Chinese women who were non-adherent to routine screening in diverse community-based settings.

Nursing Implications

Our tailored messages appear to have provided relevant information for motivating specific demographic groups of non-adherent Chinese American women in obtaining mammography screening; in particular, the study findings showed that the individually-tailored intervention may be more effective in certain demographic groups; for example, elderly group age 65 and older and recent women who have come to the U.S. for fewer than 10 years. Oncology nurses and advanced practice nurses can play critical roles in increasing mammography adherence on this medically-underserved population that experiences disparities in breast cancer mortality. In particular, they can work collaboratively with Chinese American communities and use the assessment tools developed in this study for Chinese American women on their beliefs and knowledge related breast cancer screening behaviors and provide individually-tailored counseling on breast cancer prevention and early detection to women in order to change their attitudes and correct any misconceptions regarding mammograms and motivate them getting the recommended breast cancer screening.

Limitations

Several factors should be considered. First, we utilized self-reports of screening mammography instead of chart reviews with medical record verifications. Women may have over-reported receiving mammography screening due to social desirability bias. The project team emphasized the importance of accurate reporting during the telephone encounter, a factor which may minimize potential bias. Nevertheless, the magnitude of any inaccuracy in self-report should be similar in both intervention and control groups. Because of the non-randomized sample, the findings of this study may not be generalized to Chinese American women with different demographic characteristics. Another possibility of bias lies in the self-selection to participate in the study, and we do not have any data concerning non-respondents to evaluate potential response bias. The study used a cross-sectional design;

future studies with a longitudinal cohort design will provide data to detect intervention effects on the adherence to or repeat mammography screening in this underserved population.

Conclusion

In conclusion, the study tested a theory-guided individually-tailored counseling intervention to promote mammography screening for Chinese American women. The study intervention was well accepted by study participants and perceived as feasible and culturally appropriate based on process evaluation. The study also demonstrates the feasibility of recruiting and retaining eligible women to participate, and the results show that both study intervention and printed materials increase awareness of the importance of breast cancer screening and screening behaviors. While both printed and telephone counseling strategies seemed to successfully move the immigrant Chinese population from non-adherence to taking action toward receiving regular mammography screening, future studies with a longitudinal design are needed to elucidate the active ingredients and demonstrate cost-effectiveness in order to widen our knowledge on regular breast cancer screening in this underserved population.

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Figure 1.
CONSORT chart: flow of participants through trial

Figure 2.

The percentage of women obtaining mammograms between intervention versus control group based on their insurance coverage

Figure 3.

The percentage of women obtaining mammograms between intervention versus control group based on the length of residing in the U.S. (10 years or less or 11 years or more)

Figure 4.
The percentage of women obtaining mammograms between intervention versus control group based on age (65 years and older or younger than 65 years).

Table 1

Sample Demographics by Study Groups at Baseline

	Intervention	Control	<i>p</i> value
Age			
mean	54.6	54.5	.97
>65 years	13%	16%	.66
Years in the U.S.			
<= 10 years	58%	52%	.41
> 10 years	42%	48%	
Education			
<=high school	85%	84%	.89
> high school	15%	16%	
Income			
\$<15,000	48%	47%	.93
\$15,000–30,000	32%	34%	
>30,000	20%	18%	
Insurance			
Yes	52%	48%	.83
No	48%	52%	
Insurance covering for mammogram			
Yes	58%	58%	1.00
Last mammogram			
>1 year & < 2 years	35%	36%	.96
>= 2 years (incl. never)	65%	64%	
Cognitions and Knowledge			
Perceived benefits (mean)	3.20 (2.00–4.00)	3.28 (2.40–4.00)	.20
Perceived barriers (mean/range)	2.47 (1.60–3.07)	2.49 (1.67–3.40)	.73
Perceived self-efficacy (mean/range)	2.79 (2.00–4.00)	2.76 (2.00–3.70)	.55
Knowledge on BC risk factors (mean/range)	0.49 (0.11–0.88)	0.50 (0.13–1.00)	.76
Knowledge about screening recommendation (mean/range)	2.53 (0–5)	2.22 (0–5)	.33

Table 2

Process Evaluation on Intervention Content

	Strongly Agree (SA)	Agree (A)	Subtotal (SA+A)	Neutral	Disagree
Appropriateness					
The info. I received is easy to understand	41%	53%	94%	6%	
Relevance					
The phone call is relevant and just what I need it	41%	52%	93%	7%	
The info. prepared just for me	34%	49%	83%	9%	7%
	All of info.	Most of info.		Some of it	Don't know
The amount of info. I received applies to me	31%	60%	91%	8%	1%
Thoroughness					
Learn info. about breast cancer	40%	58%	98%	2%	
Learn info. about breast cancer screening	36%	56%	92%	5%	3%
Learn info. about overcoming barriers	40%	52%	92%	5%	3%
Learn info. about benefits about getting mammogram	37%	61%	98%	2%	
Usefulness					
The info. I received is useful	47%	51%	98%	1%	1%
The info. I received is important	50%	44%	94%	6%	
Clarity					
The info. is clear	40%	55%	95%	5%	