An Intervention to Increase Mammography Use by Korean American Women

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Purpose/Objectives: To test the effectiveness of a community-based intervention to increase mammography screening for Korean American women.

Design: Quasi-experimental, pre-/post-test, three-group design.

Setting: Urban Korean American communities in Southern California.

Sample: 141 Korean American women, aged 40–75, who had not had a mammogram in the previous 12 months.

Method: Two Korean churches were selected randomly to be study sites that would provide health screening programs. The study included an experimental group that would have access to a peer-group educational program and low-cost mammography, a group that would have access to low-cost mammography alone, and a control group. Participant-focused strategies were used to involve Korean American women from the community.

Main Research Variables: Mammography use, breast cancer screening attitudes, and knowledge.

Findings: Women in the experimental program had significantly improved attitudes and knowledge about breast cancer screening. Mammography use in the experimental group (87%) was not significantly different from that in the mammography-access-only group (72%). Both interventions proved to be more effective than no intervention at all (control group = 47%).

Conclusions: An educational program that includes participant-focused research strategies and access to low-cost mammograms resulted in higher levels of screening.

Implications for Nursing: Community-focused interventions can increase rates of cancer screening among Korean American women.

Key Points . . .

➤ Developing a culturally acceptable intervention to promote breast cancer screening requires investigators to collaborate with the target community.

➤ A peer-group educational program facilitated by Korean American breast cancer survivors and an oncology nurse practitioner significantly can improve breast cancer-related knowledge and attitudes.

➤ Provision of low-cost and easily accessible mammograms is central to increasing breast cancer screening among Korean American women in an urban community.

American women fall significantly short of the National Cancer Institute's year 2000 goal of regular screening of 80% of the age-eligible women for breast cancer (Maxwell, Bastani, & Warda, 1998). Numerous other studies have reported on the low breast cancer screening rate among Korean American women: 55% in the Behavioral Risk Factor Survey (Centers for Disease Control and Prevention, 1997), 58% by Han, Williams, and Harrison (2000), and 50% by Kagawa-Singer and Pourat (2000). The results of the Behavioral Risk Factor Survey distributed in Alameda County, California, showed that Korean American women aged 50 and older are more than four times less likely to have had a mammography than women from California who are not Korean American (Centers for Disease Control and Prevention). The breast cancer screening goal of the U.S. Department of Health and Human Services (2001) for the year 2010 is to have 70% of women aged 40 and older receive a mammography within the preceding two years (U.S. Department of Health and Human Services).

Sarna, Tae, Kim, Brecht, and Maxwell (2001) reported that the majority of Korean American women, both recent immigrants and those living in the United States for many years, had low levels of participation in cancer screening. Although considerable efforts have focused on the development of breast cancer screening programs among women in general, few of these have focused on Korean American women. Many ethnic

Breast cancer is the most commonly diagnosed cancer and the second leading cause of cancer deaths among Asian and Pacific Islander women in the United States, with an incidence rate of 97.2 and a mortality rate of 12.5 per 100,000 (American Cancer Society, 2003). The most effective means of controlling morbidity and mortality from breast cancer is through early detection with regular screening mammography. Ziegler et al. (1993) reported that Asian American women had substantially higher rates of breast cancer than women in their homelands, and the risk and incidence of breast cancer increased with duration of United States residence. Ethnic and cultural values that affect attitudes about cancer screening must be considered in a cancer-control program.

Korean Americans and Breast Cancer Screening

Korean Americans are the fifth largest subgroup among Asian and Pacific Islander women in the United States (U.S. Department of Commerce, 1997). Los Angeles County in California has the largest population of Korean Americans living in the United States (U.S. Department of Commerce). Korean

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community groups have held health events, including free or low-cost mammography, but attendance has been poor. For many of these efforts, the design and delivery of programs were not tailored to be culturally appropriate and acceptable to members of the community (Kagawa-Singer, 1997).

The purpose of this study was to develop and evaluate a culturally appropriate intervention program to improve participation in breast cancer screening among Korean American women. The study was based on the participatory action research method for which the subjects are equal partners with the researcher in the entire research process of design, implementation, and evaluation (Isarel, Schulz, Parker, & Becker, 1998).

The Precede-Proceed (PRECEDE) Model (Green & Kreuter, 1991) was used as the conceptual framework for the study. PRECEDE was chosen because it recognizes multiple influences of human and environmental factors on individual health behavior. The model categorizes behavioral influences as predisposing, enabling, and reinforcing characteristics that are used mainly in this study to identify the factors associated with breast cancer screening behaviors. Predisposing characteristics are described as an individual's predisposition to seek health behavior. These are antecedents to engaging in the desired health behavior and providing motivation for and willingness to perform that behavior. In this study, predisposing factors for participation in mammography screening included breast cancer screening-related knowledge and attitudes, health history, acculturation, and sociodemographic characteristics such as age, marital status, education, and employment status. Enabling factors represent economic factors such as income, health insurance, and a regular source of health care. Reinforcing characteristics are those that support or reward the desired health behaviors. The reinforcing factor in this study refers to an intervention program called "Let's Talk Between Women" that was designed to promote breast cancer screening.

Methods

A quasi-experimental, pre-/post-test, three-group design was used to evaluate a culturally appropriate breast cancer screening program developed for Korean American women. The authors hypothesized that, in addition to access to low-cost mammography, an educational program tailored for the Korean community would be more effective in improving knowledge and attitudes about breast cancer screening and in increasing mammography use.

Sample and Setting

The study sites were selected from Korean churches in Los Angeles County. The rationale for designing a church-based program is that more than 80% of Korean Americans are affiliated with Christian churches (Kim, Yu, Chen, Kim, & Brintnall, 1998b). The role of the Korean church in the United States appears to extend beyond spiritual needs. It is the principal place for social activity, especially for Korean American women and the elderly. This strategy also allows access to a large Korean community in a short period of time and is cited in previous research as the preferred site for obtaining health information about the community (Kim et al., 1998a, 1998b; Maxwell et al., 1998). Thus, a church-based health screening program may be more effective than a traditional hospital-based health program because it provides better access to healthcare services for women who traditionally have been difficult to reach. A church-based health screening program also provides a natural and supportive environment for "normalizing" breast cancer screening practices.

A list of Korean churches was developed using two Korean business telephone directories. The churches were numbered consecutively, and six random numbers were drawn blindly from a hat. Two churches were selected and randomly assigned to one of three groups: a "Let's Talk" intervention group, a mobile mammography-only group, and a control group. Sample selection was based on nonprobability convenience sampling of Korean American women aged 40–75 who had not had a screening mammography in the prior year. To work with the target Korean American community openly, directly, and collaboratively, women's advisory committees of five to seven women were formed for each of the participating churches. The committee members were invited to participate based on the recommendations of the ministers of the churches. All committee members were middle aged and recognized as compassionate and well respected in their churches. A power analysis yielded a total sample size of 90 (30 for each group) in order to detect medium effects with a power of 0.80 at a value of 0.05.

Instruments

Champion's Attitudes Scales (Champion, 1993; Miller & Champion, 1993) and **Powe's Fatalism Inventory** (Powe, 1995) were used to assess attitudes. The attitude scales consisted of five subscales. Four subscales (susceptibility, benefits, barriers, and social influence) were from Champion's Attitudes Scales, and one subscale was from Powe's Fatalism Inventory. The Powe's Fatalism Inventory measuring the attribute of general cancer fatalism was modified to specifically address breast cancer. To minimize respondent burden, 4 of 15 items were selected during consultation with a researcher who had expertise related to Korean American women and breast cancer screening. The attitudes scales for the study consisted of 26 items—4 items for susceptibility; 6 items each for barriers, benefits, and social influence; and 4 items for fatalism. The barriers and fatalism scores were reverse coded for data analysis so that higher scores reflected more positive attitudes. The scores were computed and summed in a manner consistent with that proposed by Miller and Champion (1993). Higher scores reflected more medically positive attitudes with a possible range of scores of 26–114.

The instruments were translated to Korean and translated back to English to establish semantic equivalency. Internal consistency reliability of the instruments was retested in a sample of 31 Korean American women. Cronbach's α for the attitudes scales combing all items was 0.73. Cronbach's reliability coefficient for each subscale in the attitudes scales was 0.85 for susceptibility, 0.63 for benefit, 0.69 for barriers, 0.74 for social influence, and 0.79 for fatalism.

Miller and Champion's (1993) **Knowledge Scale** was used to measure knowledge about breast cancer screening. All seven items are multiple choice with one correct option. One point is added for each correct response with a possible range of scores of 0–7.

For the Knowledge Scale, Cronbach's α was 0.22. This low Cronbach's α indicated that knowledge in relation to the various items varied considerably for individuals. The Knowledge

Scale was re-administered 10 days later to the same group, consistent with the recommendation of Waltz, Strickland, and Lenz (1991), for test-retest reliability. The Pearson product moment correlation coefficient was 0.72.

An acculturation scale was used to examine a change of Korean cultural patterns to that of American in language proficiency, language most used, type of close friends, and food preferences. The acculturation scale used in the study originally was developed for southeast Asians (Anderson et al., 1993). Acculturation scales modified for Korean American women by Maxwell et al. (1998) were used in this study. Cronbach's reliability coefficient of the acculturation scale was 0.85 in this study.

Sociodemographic characteristics included age, marital status, education, and employment status. Health history included subjects' previous preventive medical checkup, family history of breast cancer, and personal history of abnormal mammography or breast symptoms. Enabling characteristics in the study represent income, availability and type of health insurance, and availability and type of regular source of health care. These characteristics are similar to those used in a previous mammography study (Maxwell et al., 1998; Miller & Champion, 1993, 1996).

Procedure

The experimental intervention program "Let's Talk Between Women" included peer-group education about breast cancer screening and access to a free or low-cost mobile mammography service. Content of the intervention program was based on comments from three focus group discussions and the women's advisory committees. The "Let's Talk" program was pilot-tested prior to implementation. A second treatment group (mobile mammography-only group) received access to a free or low-cost mobile mammography service alone. The control group did not receive either intervention. The study protocols were approved by the institutional review board (IRB) at the University of California, Los Angeles.

The women's advisory committees served as an advisory body throughout all phases of the study, including refining the intervention program, publicizing the study, and distributing and collecting the questionnaires. Recruitment of participants took a variety of forms. An IRB-approved flyer describing the study was posted in the lobby of the churches. The advisory committee members of each participating church also personally invited eligible Korean American women in their congregations to attend the program. The minister of each church made an announcement about the opportunity to participate.

Baseline test: In the beginning of the study, the women in the "Let's Talk" group were informed that they would participate in a peer-group educational program and had an option to use a free or low-cost mobile mammography service at their church a week later. The women in the mobile mammography-only group were informed that they had an option to use the free or low-cost mobile mammography at their church one week after the baseline tests.

The baseline tests were administered to all participants in the three groups to evaluate the equivalence of the groups. The baseline tests included assessments of breast cancer-related attitudes and knowledge; health history; sociodemographic data; acculturation; and enabling resources. The participants completed the questionnaires in a private room or any other area in the church where they felt comfortable. The investigator or

members of the women's advisory committees were available to answer participants' questions.

Peer-group education and post-test: After completion of the baseline test, the "Let's Talk" group participated in peer-group education. Traditional Korean foods and beverages were served before the education session. The education team included two local Korean American breast cancer survivors and one female Korean American nurse practitioner with expertise related to breast cancer screening. The survivors were recruited from a Korean breast cancer support group, which was sponsored by three organizations (a local hospital in Koreatown, the American Cancer Society, and the Wellness Community). The survivors had received two training sessions, each lasting two hours, before facilitating the actual education.

The peer-group education program began with the pastor offering a prayer and expressing approval and appreciation of the program. The cultural forces shaping the health of Korean American women were incorporated in the education session that addressed their cultural values, perception, and expectations. The educators started by describing their hardship as immigrants, because all of the participants in the study were first-generation immigrants. Sharing experiences in common would not only increase group cohesiveness with educators but also increase perceived vulnerability when women saw that people just like themselves could develop breast cancer. As with other Asian cultures, the traditional role of Korean women is to focus their energies on their families and sacrifice their own needs. Getting a mammogram might be viewed as selfish and disruptive to the welfare of the family because it requires time, energy, and money. Further, a fatalistic view of cancer is widespread among Koreans. Members of the peer-group education team guided the discussion by addressing these issues, sharing their personal cancer experiences, and highlighting the importance of early detection and the necessity of a woman staying healthy to care for her family. Because of the value and importance of the group, as opposed to the individual, in Korean culture, the peer-group influence was more likely to change health behaviors than individual strategies. The educational program also included information about what a mammogram is, how it is performed, and how to obtain access to mammography in the community. The program lasted approximately one hour. A test of attitudes and knowledge was administered at the end of the program.

Mobile mammography access: Access to free or low-cost mobile mammography services, the second component of the intervention, was provided on site at the church one week after the baseline test for the "Let's Talk" group and the mobile mammography-only group. A local hospital located in Koreatown provided certified mobile mammography services.

Control group: For the control group, a cholesterol educational program, along with low-cost blood chemistry and osteoporosis screening tests, was provided. After completion of the study, the control group received an information package (written in Korean), which consisted of an American Cancer Society brochure on breast cancer screening and community resources for free or low-cost mammography service.

Mammography use: To assess whether participants actually participated in mammography screening, women in all three groups were contacted two months after the baseline test. This time period allowed women who preferred to use their own healthcare resource for mammography to initiate their own appointment for screening.

Statistical Analysis

Analyses were conducted using the SPSS®/PC (Version 6.0) (SPSS, Inc., Chicago, IL) . Descriptive statistics were used to describe sociodemographic characteristics, health screening history, and breast cancer-related knowledge and attitudes. To properly evaluate the impact of the interventions on mammography use, the equivalence of the sample characteristics of the three study groups was evaluated at baseline using a chi-square statistic for the categorical variables and analysis of variance (ANOVA) for continuous variables. Further, the sample characteristics significantly related to mammography use were identified using a chi-square statistic and ANOVA.

To evaluate the impact of the educational program in improving knowledge and attitudes, a paired t test was used to compare baseline and post-test scores in the experimental ("Let's Talk") group. Significant variables related to mammography use were controlled using logistic regression to examine the impact of the education intervention on mammography use in comparison to receiving the mobile mammography service alone. First, the authors compared mammography use in the "Let's Talk" group with use in the mobile mammography-only group by creating two dummy variables with the "Let's Talk" group as a reference category. A binary variable of mammography use (yes/no) was created and used as the dependent variable. In step 2, the same statistical procedure used in step 1 was applied, except that the mobile mammography-only group was used as a reference category, which allowed the authors to compare the impact of access alone with the control group.

Results

One hundred forty-one Korean American women participated in the study—47 in the "Let's Talk" group, 48 in the mobile mammography-only group, and 46 in the control group. Characteristics of the sample appear in Table 1. No significant differences existed by group at baseline in regard to demographics and health screening variables. The majority (91%) of the women were between the ages of 40 and 59, with a mean age of 47.9 and a range of 40–75. Most (84%) were married, and 94% had at least a high school education. Half (50%) of the women reported an annual household income less than $25,000, and only 22% had health insurance. Most (54%) were employed, and 70% had lived more than 10 years in the United States (mean length of residency = 13.4 years; range = 4 months–30 years).

Almost half (45%) of the women had a regular healthcare provider, and 43% of their healthcare providers were Korean. The majority (80%) had had a Pap test at least once, and 92% had no personal history of breast problems. More than half (55%) had received a screening mammogram at least once. About one-third (36%) had received their last mammogram one to two years prior to the study, 11% had received one within two to four years, and 9% had received one more than five years ago. Only 5% had received more than two screening mammograms.

The findings supported the hypothesis that the "Let's Talk" intervention would significantly increase the participants' use of mammography. Of 141 women who participated in the study, 98 (70%) reported that they had received

Table 1. Demographic Characteristics

Variables	"Let's Talk" Group (n = 47)	Mobile Mammography-Only Group (n = 48)	Control Group (n = 46)	Total (N = 141)
Age (years)				
40–49	66%	71%	61%	66%
50–59	30%	21%	24%	25%
60–65	4%	8%	15%	9%
Education				
Less than high school	2%	8%	2%	6%
High school	45%	34%	37%	37%
College or higher	53%	58%	60%	57%
Annual income				
< $10,000	11%	10%	15%	12%
$10,000–$24,999	43%	46%	22%	38%
$25,000–$39,000	30%	21%	28%	26%
> $40,000	17%	23%	33%	24%
Health insurance				
No	75%	83%	76%	78%
Yes	26%	17%	22%	22%
Residency in the United States (years)				
< 9	17%	42%	30%	30%
10–19	53%	38%	41%	44%
20–30	30%	21%	28%	26%
Regular healthcare provider				
No	53%	56%	50%	55%
Yes	47%	44%	50%	45%
History of a physical examination				
Never	51%	48%	41%	45%
Within 1 year	21%	13%	26%	20%
1–2 years ago	11%	21%	17%	16%
2–4 years ago	11%	13%	9%	11%
More than 5 years ago	6%	6%	7%	8%
History of Pap test				
Never	17%	21%	22%	20%
Within 1 year	40%	26%	33%	33%
1–2 years ago	19%	19%	17%	18%
2–4 years ago	11%	27%	11%	16%
More than 5 years ago	13%	10%	17%	14%
Personal history of breast problems				
No	92%	89%	93%	92%
Yes	9%	10%	7%	9%
Family history of breast cancer				
No	83%	85%	70%	79%
Yes	17%	15%	30%	21%
Breast self-examination				
Never	34%	33%	39%	36%
Once per month	6%	4%	0%	3%
Every now and then	60%	63%	61%	59%
Past mammogram use				
Never	36%	56%	39%	45%
1–2 years ago	51%	21%	41%	36%
2–4 years ago	4%	19%	11%	11%
5 years ago	9%	6%	11%	9%

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

a screening mammogram during the study period (87% of the "Let's Talk" group, 72% of the mobile mammography-only group, and 47% of the control group). The "Let's Talk" group also demonstrated significantly improved breast cancer screening-related attitudes and knowledge (see Table 2 and Table 3).

Because statistical analysis showed that a Pap test (c^2 = 6.27, p = 0.01), benefit (odds ratio = 1.32, 95% confidence interval [1.01, 1.68]), and susceptibility (odds ratio = 1.34, 95% confidence interval [1.06, 1.68]) at baseline were significantly related to mammography use, these three variables were controlled in logistic regression evaluating mammography use. Women in the "Let's Talk" group had more mammograms than those in the mobile mammography-only group, but this difference was not statistically significant (see Table 4). The women in the control group had significantly fewer mammograms during the study than the women in the "Let's Talk" group, and this difference was statistically significant.

After completion of the project, discussions with the women's advisory committees were conducted to evaluate the process. Committee members pointed out that being actively involved in the program had been a rewarding and empowering experience.

Discussion

The low rate of screening found in this study (55%) before implementation of the intervention is far below the national objective. This rate is similar to those of other studies among Korean American women (e.g., Centers for Disease Control and Prevention, 1997; Han et al., 2000; Kagawa-Singer & Pourat, 2000). The rate of mammography screening within the prior two years for the sample was 36%. This is similar to the rates reported in other studies among Korean American women. In 1998, Wismer et al. and Maxwell et al. reported rates of 34% and 36%, respectively. However, these rates are far lower than the 57% reported for Asian women, 66% reported for Hispanic women, 76% reported for white women, and 80% reported for African American women in the California Behavioral Risk Factor Survey (Davis, 1996). Only 5% of the women in this study had received a mammogram regularly for more than the past two years. This is far lower than the 21% three-year adherence reported rate for a convenience sample of American women (Miller & Champion, 1996).

The "Let's Talk" program provided an effective way to improve knowledge and attitudes related to breast cancer screening, and, more importantly, to increase mammogram screening practice. A higher percentage of women in the "Let's Talk" group (87%) had screening mammograms during the study period than in the other groups (mobile mammography-only = 72%, control group = 47%).

This study demonstrated the effectiveness of the educational program in improving knowledge and attitudes, but these factors did not significantly improve screening rate when compared with providing the women with a low-cost mobile mammography service alone. The provision of low-cost or free mammography in an accessible and familiar setting such as the participants' churches also contributed to increased screening. This finding is similar to those reported in other mammography studies involving Korean American women (Maxwell et al., 1998) and American women (Miller & Champion, 1993). Maxwell et al. reported in their cross-sectional study that economic factors such as health insurance coverage and income were significantly related to Korean American women's mammography screening rate, but knowledge and misconceptions about breast cancer were not. Miller and Champion (1993) also reported similar findings. However, other studies also have shown that low-cost or mobile mammography services do not eliminate all the barriers that inhibit women from receiving a mammogram (Kagawa-Singer, 1997; Levin et al., 1997).

In this study, the low-cost mammography service was organized and provided in a culturally sensitive way. The women's advisory groups were actively involved and encour-

Table 2. Educational Intervention Impact on Knowledge About Breast Cancer Screening

Item in Knowledge Scale	Baseline % Correct	Post-Test % Correct	p
Mammography guideline	76.61	95.71	0.011
Age as risk factor	29.81	91.52	< 0.001
Family history as risk factor	93.62	95.72	NS
Breast cancer symptoms	59.61	80.94	< 0.001
Screening methods	42.61	89.44	< 0.001
Recommended interval for breast self-examination	60.80	86.39	< 0.001
Incidence	63.83	89.42	< 0.001
Knowledge mean score (SD)	3.66 (1.15)	5.36 (0.85)	< 0.001

N = 47

Table 3. Impact of Intervention on Attitudes About Breast Cancer Screening

Subscale in Attitudes Scale	Range	Mean Score Baseline Test	Mean Score Post Test	p
Susceptibility	4–12	5.8	9.3	< 0.001
Benefits	5–15	14.3	14.5	NS
Barriers	6–18	9.0	12.0	< 0.001
Social influence	5–45	29.6	35.0	< 0.001
Fatalism	4–12	6.8	8.8	< 0.001
Attitudes (SD)	24–102	65.3 (11.1)	79.8 (9.5)	0.000

N = 47

Table 4. Actual Mammogram Use by the Study Group

Variable	Odds Ratio	Confidence Interval (95%)	
		Lower	Upper
Mobile mammography-only group	0.39	0.13	1.19
Control group	0.13*	0.04	0.38
Pap test	2.69	0.99	7.26
Benefits	1.15	0.84	1.57
Susceptibility	1.30*	1.04	1.64

* p < 0.05

aged women to participate in screening, and the mammography service was available in a familiar and comfortable setting (i.e., their own churches). Providing easily accessible cancer screening programs may be more productive than providing costly knowledge-based educational programs.

This study demonstrated that using participant-focused research strategies with a Korean American community could create a supportive environment to facilitate outreach efforts to promote early cancer detection. To gain access to a population that is traditionally hard to reach, nurses should recognize the important role of the target community and use social networks and key informants from the community. This study also supports the use of lay health educators in improving knowledge and attitudes.

Limitations

Although the study sites were sampled and assigned randomly, participating subjects were not selected randomly. The participants were predominantly low-income, monolingual, Korean American women residing in Los Angeles County. Thus, the study findings cannot be generalized for high-income, bilingual, Korean American women or those residing outside of Los Angeles County. Mammography use was based on self-report, and actual mammography use was not validated via medical record review. Many other studies have shown self-reported mammography use to be reasonably reliable, including studies targeting low-income, nonwhite populations (Zapka et al., 1996). However, there are no published studies involving Korean Americans that validate this assumption. The self-reported data also might reflect a response bias that resulted in the women providing socially desirable responses. It is possible that motivated women were more eager to participate. The bias introduced by not including those women not motivated to participate in the study is unknown. Not all of the variables that potentially could influence mammography use were measured, which might have affected the study outcomes.

Future Study

Health educational programs such as the "Let's Talk" program can be time consuming, labor intensive, and costly. Future studies are needed to investigate the cost-effectiveness of educational interventions among Korean Americans. The potential indirect outcomes of programs, such as how they affect rescreening rates, should be considered. Because benefits of mammography are ensured when used regularly, future research should investigate how improvement in knowledge or attitudes might influence continued use of mammography in a longitudinal study design. Improved knowledge and attitudes may predict continued use of mammography more so than one time use.

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