Title
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Permalink
https://escholarship.org/uc/item/75j285ccq

Journal
Journal of Immigrant and Minority Health, 18(1)

ISSN
1557-1912

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Publication Date
2016-02-01

DOI
10.1007/s10903-015-0164-6

Peer reviewed
Korean American Women and Mammogram Uptake

Eunice E. Lee · Karabi Nandy · Laura Szalacha · HanJong Park · Kyeung Mi Oh · Jongwon Lee · Usha Menon

Abstract A high percentage of Korean American (KA) women have never had a mammogram, which puts them at greater risk for late-stage breast cancer. The aim of this study was to compare health beliefs and spousal support about breast cancer and screening between KA women with and without a history of mammogram completion. Cross-sectional data were obtained from 428 non-adherent married KA women. KA women who never had a mammogram were younger, had less access to health care, had less knowledge, and had lower perceived self-efficacy, benefits, and spousal support, and higher perceived barriers to breast cancer screening compared to women who had had a mammogram. Assessing differing characteristics between the two groups of KA women may lead to a better understanding of the variables influencing mammography screening in this population and possibly increase early screening.

Keywords Breast cancer · Mammography · Health beliefs · Korean American women · Spousal support

Background Breast cancer (BC) is the most commonly occurring cancer in Korean American (KA) women, with a prevalence of 53.5 per 100,000 [1]. The BC incidence rate for KA women almost doubled between 1990 and 2008 [2]. The rising BC incidence in KA women could be due, in part, to their immigrant status, as there is evidence that BC rates increase over time for immigrants living in the United States [3]. About three quarters of KAs in the United States (78 %) are immigrants [4], making them an important population to target for early detection of BC via regular screening.

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Breast cancer screening rates for KA women, however, are comparatively low. Only 22–39% of KA women reported having had a mammogram within the previous year, whereas more than 50% of White, African American, and Hispanic women had yearly mammograms [5–7]. More notably, 22–52% of KA women have never had a mammogram [8–16], placing them at greater risk for detecting BC in later stages. The alarmingly high rate of unscreened KA women indicates an urgent need to understand this vulnerable subgroup of KAs and to develop targeted interventions for them.

Theoretical Framework

The framework that guided this study was drawn from the health belief model (HBM) [17, 18]. Based on the HBM, people change their health behaviors if they have greater perceived susceptibility, seriousness, and benefits of the outcome; if they believe that the costs of their course of action (perceived barriers) are outweighed by its benefits; and if they feel confident in their ability to take action (perceived self-efficacy) [18]. In general, knowledge of cancer and mammograms influences screening participation among women [19–23]. KA women are known to have a relatively low level of knowledge about BC and mammograms [24, 25]. Knowledge of BC and screening appears to influence beliefs about seriousness, susceptibility, and benefits of screening in KA women. When KA women had limited knowledge about BC, they had inaccurate beliefs [26]. For example, most KA women believed family history was the only risk factor for BC, leading them to perceive they were not susceptible to BC because they did not have a family history of the disease.

Self-efficacy is related to mammogram attainment among Korean women living in Korea [27]. In a study of Caucasian and African American women, self-efficacy was positively related to adherence to regular mammograms in Caucasian women but negatively related to adherence in African American women, although the relationship in the latter case was not significant [28]. To the best of our knowledge, no published study has examined self-efficacy for mammography in KA women.

It is generally acknowledged that social support from significant others positively correlated with BC screening utilization, especially among minority women [29–31]. Specifically, KA women who received support from family members were almost four times more likely to have had a mammogram than those who did not receive such support [25]. Korean women who had American husbands reported higher levels of support from their husbands and were more likely to practice breast self-examination than were women married to KA men [25]. These findings demonstrate the need for understanding the relationship between support received from husbands and BC screening behaviors among their KA wives.

Although some KA women have specific beliefs that hinder them from obtaining routine mammograms, such as the perception that they are at low risk for BC as long as they stay healthy, exercise, or have a positive attitude [26], it is not known whether such beliefs differ between KA women who have or have not had a mammogram. Understanding the sociodemographic factors (age, employment, education, income, level of acculturation, and health care access) and beliefs related to BC and screening of these two groups is necessary to develop more sophisticated targeted screening interventions for those never screened.

Therefore, we analyzed pre-intervention data from the Korean Immigrants & Mammography–Culture-specific Health Intervention (KIM–CHI), a large randomized controlled trial focused on improving mammography adherence among non-adherent KA women, to compare sociodemographic factors and health beliefs about BC and screening between adherent and non-adherent KA women [32]. Based on the American Cancer Society’s recommendations for annual mammograms for women aged 40 and older [33], we defined non-adherent to be if one had not been screened within previous year of data collection. We also compared baseline data for husbands’ knowledge about BC and screening, and their perceptions of support provided to their wives for BC screening between the two groups of KA women.

Our hypotheses were:

1) KA women who had a mammogram would report more desirable levels of social demographics, health care access, health beliefs (knowledge, susceptibility, seriousness, benefits, barriers, and self-efficacy), and spousal support than would KA women who had never been screened.

2) Husbands of KA women who had a mammogram would report higher levels of knowledge and spousal support than would husbands of KA women who had never been screened.

3) Women’s health beliefs, husbands’ and women’s perceived spousal support, and husbands’ knowledge would predict KA women’s mammography utilization after statistically controlling for demographics and health care access.

Methods

This study compared groups of KA women who had a mammogram with women who had never had one using
baseline cross-sectional data from the KIM-CHI trial. Thebaseline data were collected from August 2008 to Junebaseline data were collected from August 2008 to June2009 from 428 KA couples residing in Cook County,2009 from 428 KA couples residing in Cook County, Illinois.

Participants
Korean churches were approached as culturally acceptableKorean churches were approached as culturally acceptabledata collection sites. Research shows that 78 % of KAs areChristian and 63 % participate in religious activities atleast once a month, suggesting that churches were goodsites for recruiting samples representing KAs living in urbanareas [34]. Invitation letters were sent to all 210 reli-gious organizations in the Chicago Korean BusinessDirectory. Of those, we were able to contact 100 organi-zations by phone and found that 32 were ineligible due tonot having eligible study participants in their congrega-tions. About a quarter \((n = 18, 26.5 \%)\) of the remaining68 eligible organizations chose to not participate in thestudy. Study participants were recruited from the remaining50 KA religious organizations. To avoid bias in participantresponses, we chose cluster sampling so that organizationswere randomly assigned to one program or the other. Thecharacteristics of religious organizations (location and size)were compared to ensure that the two groups were notsignificantly different after the randomization.

Participants were recruited at each organization onParticipants were recruited at each organization onSundays after the religious organization leader announcedSundays after the religious organization leader announcedour program during the service. Participants were includedif they were immigrant women aged 40 years or older, ableto communicate in Korean, and married to a KA immigran-man who also could communicate in Korean. Participantswere limited to first-generation KA immigrants becauseattitudes and perceptions about cancer-screening servicescould differ substantially between first- and second-gen-eration KA women. Women who had had a mammogramwithin the previous year or who had been diagnosed withBC were excluded for the purpose of providing the inter-vention to non-adherent KA women.

Measures
The primary outcome of having or never having had aThe primary outcome of having or never having had a mammogram was measured by self-report. Sociodemo-graphic information (age, employment, education, income,and level of acculturation) was obtained from both wivesand their husbands. The level of acculturation was mea-sured by the Suinn-Lew Asian Self-Identity AcculturationScale (SL-ASIA), which has good internal consistencyreliability and established concurrent and construct validity[35, 36]. The higher the total score, the higher the level ofacculturation. One item about generation was removedbecause all of the couples in our sample were first-gen-eration KA immigrants. The words “Asian” and“Oriental” in the original instrument were also changed to“Korean.” KA women also responded to questions onhealth care resources and utilization; for example, whetherthey had health insurance and a usual source of care (a regular clinic or doctor to visit) and whether they had a physical examination in the previous two years. Onequestion asked whether they had relatives who had been diagnosed with BC.

Knowledge about BC and screening was measured inboth the women and their husbands. Twelve items fromKnowledge about BC and screening was measured inboth the women and their husbands. Twelve items fromChampion’s original 20-item scale measuring knowledgeabout BC (6 items) and mammography (6 items) were usedfor this study. The items had multiple choice and yes/noresponses, with each response coded as correct or incorrect.

We used Champion’s original Breast Health Survey toWe used Champion’s original Breast Health Survey tomeasure perceived susceptibility, seriousness, benefits,bars, barriers, and self-efficacy of KA women, as these scaleshave demonstrated good internal consistency, reliabilityand validity [37, 38]. The survey was adapted to make itculturally appropriate and translated into Korean in ourprevious studies [32, 39]. All of the subscales used Likert-type ratings, with a higher score indicating a higher per-ceived level of belief. The internal consistency reliabilityfor the modified Champion’s Breast Health Survey sub-scales on health beliefs of perceived susceptibility (4 items), seriousness (9 items), benefits (7 items), and bar-riers (16 items) from our baseline data were 0.84, 0.81,0.73, and 0.88, respectively.

We developed five items measuring encouragement andWe developed five items measuring encouragement andsupport received or provided from husbands to wives, witha higher score indicating a higher level of support. Toassess the different types of support received, the items had4- and 5-point Likert-type responses.

Data Collection and Analysis
Data were collected after religious services from 50 KAData were collected after religious services from 50 KA religious organizations after the research was approved byreligious organizations after the research was approved bythe University of Illinois at Chicago’s Institutional Reviewthe University of Illinois at Chicago’s Institutional ReviewBoard. Couples who were interested in participating in thestudy were asked to gather in a designated room to ensurethat both husbands and wives participated. Each coupleBoard. Couples who were interested in participating in thestudy were asked to gather in a designated room to ensurethat both husbands and wives participated. Each couplesigned consent forms and then completed a Korean-lan-guage questionnaire.

For the first and second hypotheses, Fisher’s exact testsFor the first and second hypotheses, Fisher’s exact testswere used to assess statistical differences between groupsfor categorical variables. \(F\) tests from fitting generalizedlinear models were used to test differences between groupsfor continuous variables. For the third hypothesis, multiplelogistic regression models were fit to predict the likelihoodof KA women having ever had a mammogram. Predictorsin the initial model included all independent variables that
were significantly associated with mammogram uptake in preliminary bivariate analyses at the alpha = 0.15 level. The final model included all covariates that were significant at the 0.10 level. Goodness-of-fit was assessed using Hosmer–Lemeshow chi-square test, as well as the area under the receiver operating characteristic (ROC) curve. All statistical analyses were performed using SAS version 9.3 and STATA 9.

Results

Table 1 presents the characteristics of the 428 KA women in the study. A total of 321 women had previously undergone mammography screening (75 %), and 107 women had never been screened (25 %). The overall sample was primarily middle-aged ($M = 52.3$ years, $SD = 9.0$). The majority was employed, and 55 % reported an average annual household income greater than $40,000. About half of the participants had health insurance (59 %), a regular clinic or doctor for health care (54 %), and regular wellness checkups in the previous two years (51 %). About one fifth (22 %) of the participants reported having BC in their family.

The first hypothesis stated that those KA women who had a mammogram would report more desirable levels of social demographics, health care access, health beliefs and spousal support than would KA women who had never been screened. Age, health insurance, having a regular clinic or doctor for health care, having regular checkups without symptoms, and health beliefs of knowledge, benefits, barriers, self-efficacy, and spousal support were different between the two groups of women (Table 1). Women who had at least one mammogram in their lifetime were significantly older ($M = 54$ years, $SD = 8.6$) than were those who had never had a mammogram ($M = 48$ years, $SD = 9.3, p < 0.001$). All the measures of health care access differed significantly between the two groups. A significantly higher proportion of those who had a mammogram reported having health insurance compared with those who had not ($p < 0.001$), and similar proportions reported having a regular doctor or clinic for health care ($p < 0.001$). Women who had had a mammogram were also more than twice as likely to have visited a doctor within the previous two years even when they did not have any symptoms (for the purpose of screening only) compared with women who never had one ($p < 0.001$). There was no difference in family history of BC between the two groups.

Those who had a mammogram were significantly more knowledgeable about BC than were those in the other group ($p < 0.001$). Significant differences were seen between the two groups in the areas of perceived benefits of a mammogram, barriers, and self-efficacy ($p = 0.001$, $<0.001$, and $<0.001$, respectively). Those who had a mammogram reported greater support received from their spouses than did those who were never screened ($p < 0.01$).

Hypothesis 2 stated that husbands of KA women who had been screened would report higher levels of knowledge and spousal support than would husbands of KA women who had never been screened. This hypothesis was rejected because the level of husbands’ knowledge about BC and screening was not significantly different between the two groups of women. When spouses were asked about the support they had provided their wives, spouses of women who had a mammogram reported a marginally higher perception of providing support than did the spouses those never screened.

The third hypothesis stated that women’s health beliefs, husbands’ and women’s perceived spousal support, and husbands’ knowledge would predict KA women’s mammography utilization. Table 2 shows the results of a logistic regression model predicting mammography uptake over a lifetime (at least one versus none). Significant predictors were health beliefs, controlling for age and whether one had a regular checkup without being sick in the previous two years. All other factors being constant, a 1-point positive difference in seriousness was associated with twice the odds for that person to have had a mammogram ($p = 0.001$). Similarly, every 1-point positive difference in self-efficacy was associated with three times the odds of being screened ($p < 0.01$). 1-point positive difference in perceived support from a spouse was associated with twice the odds of being screened ($p < 0.05$). A 1-point decrease in barriers was associated with an 83 % increase in the odds of being screened ($p < 0.0001$). The area under the curve of the associated ROC curve was 0.86, showing evidence of good fit of the model. The Hosmer–Lemeshow goodness-of-fit statistic resulted in a chi square = 4.87 ($df = 8, p = 0.77$), which also indicated good model fit.

Discussion

Our results demonstrate that perceived health beliefs and perceived spousal support are crucial components of non-completion of mammograms in non-adherent KA women. This underscores the importance of understanding the relationship between KA women’s health beliefs and their health behaviors of ever or never having had a mammogram. These results can provide important guidance to the development and revision of interventions to promote BC screening among the subpopulation of KA women who have never had a mammogram.

It is very important to understand Asian American women’s BC screening behaviors, not just those of KA women, since 70 % of Hmong [39], 36 % of Chinese [40],
Table 1 Baseline characteristics of Korean American women by mammogram history

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Overall (N = 428)</th>
<th>Screened (n = 321)</th>
<th>Never Screened (n = 107)</th>
<th>p Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years, mean (SD)*</td>
<td>52.25 (9.03)</td>
<td>53.61 (8.55)</td>
<td>48.46 (9.31)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Level of acculturation, mean (SD)</td>
<td>2.02 (0.29)</td>
<td>2.02 (0.29)</td>
<td>2.00 (0.30)</td>
<td></td>
</tr>
<tr>
<td>Employed, % (n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>69.50 (297)</td>
<td>68.12 (219)</td>
<td>73.27 (78)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>30.50 (131)</td>
<td>31.88 (102)</td>
<td>26.73 (29)</td>
<td></td>
</tr>
<tr>
<td>Education, % (n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; High school</td>
<td>39.86 (171)</td>
<td>40.91 (131)</td>
<td>36.79 (39)</td>
<td></td>
</tr>
<tr>
<td>≥ High school</td>
<td>60.14 (257)</td>
<td>59.09 (190)</td>
<td>63.21 (68)</td>
<td></td>
</tr>
<tr>
<td>Annual household income, % (n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; $40,000</td>
<td>45.28 (194)</td>
<td>42.41 (136)</td>
<td>53.01 (57)</td>
<td></td>
</tr>
<tr>
<td>≥ $40,000</td>
<td>54.72 (234)</td>
<td>57.59 (185)</td>
<td>46.99 (50)</td>
<td></td>
</tr>
<tr>
<td>Health care access, % (n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health insurance, % (n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>59.34 (254)</td>
<td>64.79 (208)</td>
<td>44.33 (47)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>No</td>
<td>40.66 (174)</td>
<td>35.21 (113)</td>
<td>55.67 (60)</td>
<td></td>
</tr>
<tr>
<td>Regular healthcare provider, % (n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>53.59 (229)</td>
<td>61.61 (198)</td>
<td>30.56 (33)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>No</td>
<td>46.41 (199)</td>
<td>38.39 (123)</td>
<td>69.44 (74)</td>
<td></td>
</tr>
<tr>
<td>Checkup in previous 2 years, % (n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>51.31 (220)</td>
<td>59.49 (191)</td>
<td>27.78 (30)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>No</td>
<td>48.69 (208)</td>
<td>40.51 (130)</td>
<td>72.22 (77)</td>
<td></td>
</tr>
<tr>
<td>Health beliefs, mean (SD)f</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant knowledge</td>
<td>3.73 (1.27)</td>
<td>3.85 (1.26)</td>
<td>3.39 (1.24)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Husband knowledge</td>
<td>3.45 (1.25)</td>
<td>3.49 (1.26)</td>
<td>3.31 (1.22)</td>
<td></td>
</tr>
<tr>
<td>Susceptibility</td>
<td>2.36 (0.75)</td>
<td>2.34 (0.75)</td>
<td>2.44 (0.74)</td>
<td></td>
</tr>
<tr>
<td>Seriousness</td>
<td>2.87 (0.69)</td>
<td>2.89 (0.69)</td>
<td>2.82 (0.68)</td>
<td></td>
</tr>
<tr>
<td>Benefits</td>
<td>3.79 (0.48)</td>
<td>3.84 (0.43)</td>
<td>3.66 (0.60)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Barriers</td>
<td>2.24 (0.61)</td>
<td>2.12 (0.59)</td>
<td>2.58 (0.54)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>3.70 (0.47)</td>
<td>3.77 (0.46)</td>
<td>3.50 (0.44)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Spousal support, mean (SD)f</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant perception of spousal support received</td>
<td>2.84 (0.51)</td>
<td>2.88 (0.50)</td>
<td>2.72 (0.52)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Husband spousal support provided</td>
<td>3.01 (0.35)</td>
<td>3.03 (0.35)</td>
<td>2.96 (0.34)</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

N = 428

*p values are associated with F-tests from fitting generalized linear models for continuous variables; all other p values are associated with Fisher’s exact tests

Table 2 Logistic Regression Model for Predicting Mammogram Use

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Estimated AOR (95 % CI)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>*AOR adjusted odds ratio.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hosmer–Lemeshow goodness-of-fit chi square = 4.87 (df = 8) and associated p value = 0.77</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Demographic characteristics

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Estimated AOR (95 % CI)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1.12 (1.07, 1.16)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Regular access to health care (yes vs. no)</td>
<td>2.44 (1.34, 4.64)</td>
<td>0.004</td>
</tr>
</tbody>
</table>

Health beliefs and spousal support

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Estimated AOR (95 % CI)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seriousness</td>
<td>2.25 (1.40, 3.63)</td>
<td>0.001</td>
</tr>
<tr>
<td>Barriers</td>
<td>0.17 (0.09, 0.32)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>3.07 (1.48, 6.38)</td>
<td>0.003</td>
</tr>
<tr>
<td>Wives’ perceived support received</td>
<td>1.99 (1.14, 3.48)</td>
<td>0.02</td>
</tr>
</tbody>
</table>
and 61% of Southeast Asian and Pacific Islander (Cambodian, Laotian, Thai, Vietnamese, Chamorro, Samoan, and Tongan; [41, 42] women have never had a mammogram. Our findings may help health care professionals and researchers to understand the characteristics associated with mammography completion in KA women as well as apply this knowledge to other Asian American women because most Asian Americans come from similar cultures [43–46].

It is well known that problems with health care access are related to KA women’s BC screening behaviors [6, 10, 14, 15]. Our findings indicate that the negative impact of not having health care access has more of an effect on women who have never had a mammogram than on their counterparts who have had one in the past. Such programs should include education and training of community partners to publicize sites where people can obtain free or low-cost health care on a regular basis.

Although knowledge and awareness of the benefits of mammography were significantly different, while the perceived seriousness of cancer was not different between the two groups of KA women in bivariate relationships, the final model did not include knowledge and benefits, but included seriousness. The individual effect of knowledge and awareness of benefits could have been reduced when they were put into one model, or knowledge and awareness of benefits could have perhaps mediated the influence of perceived seriousness.

KA women’s perceptions of spousal support were related to their having had a mammogram, as hypothesized. To the best of our knowledge, this is the first published report testing spousal support in promoting BC screening. The way social support positively contributes to cancer screening utilization is not clear, but it could be speculated that social support motivates women to learn about cancer screening, provides women with assistance to overcome barriers, and influences women’s knowledge and beliefs about BC and screening by having this discussion with their spouses. Based on our preliminary review of recordings of the husband-wife interactions post-intervention in a subset of the sample, we see trends that support our speculation (manuscript under development). KA women have traditionally been raised to sacrifice their own needs to meet those of their families. They need to hear from their family members, especially from husbands, that maintaining their own health is important and that using the family’s resources such as time and money for disease prevention is important so that they can care for their family.

The results of this study need to be interpreted with caution. We compared women who never had a mammogram with those who had a mammogram in the past but not in the previous year. Had we compared those who had never had a mammogram with those who had annual mammograms, the differences could have been broader than those we found.

Our study has several limitations. The findings of this study may not be generalizable to KA women who live in different geographical locations, who are unmarried, and who do not attend religious organizations. As reported for other cultures [47], KA religious organizations also function as social organizations that provide fellowship, help to maintain traditional culture, to receive social services, and to be recognized for their social status or position [48, 49]. Further, providing health-related assistance is a core component of their ministry [34]. However, women living in geographical areas where there are no KA religious organizations could have different health beliefs than the KA women in this study. In addition, the outcome of having versus never having had a mammogram is based on self-report, which could be biased or inaccurate.

New Contribution to the Literature

We found that KA women who had never had a mammogram had different characteristics than their counterparts who had previously had a mammogram. Interventions targeting those differences could be helpful in decreasing disparities within the KA population. Further, considering that Asian American women in general have a higher prevalence of not having a mammogram in their lifetimes, continued attempts should be made to understand their characteristics and develop culturally sensitive and targeted interventions to decrease health disparities. Most Asian Americans come from cultures in which family members and significant others have a very substantial influence on women’s cancer screening behaviors [43–46]; therefore, these factors warrant deeper study if we are to facilitate adherence of Asian American women to current recommendations for BC screening.

Acknowledgements This work was supported by a grant from the National Cancer Institute (R01CA127650). This study was approved by the Institutional Review Boards of the University of Illinois at Chicago and University of California, Los Angeles. We gratefully acknowledge the Korean American couples who consented to participate in the study and the leaders of the multiple Korean religious organizations that were data collection sites. We also appreciate the University of California, Los Angeles, School of Nursing’s Dr. Priscilla Kehoe for reviewing our manuscript.

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