

RESEARCH ARTICLE

Breast Cancer Screening Disparity among Korean American Immigrant Women in Midwest

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Abstract

Purpose: Using three breast cancer screening methods such as mammogram, Clinical Breast Examination (CBE), and Breast Self-Examination (BSE), this study investigated breast cancer screening rates and its associated factors in Korean American immigrant women. **Method:** Cross-sectional data were obtained from 168 Korean immigrant women aged 40 and older in Midwest. The Andersen's Behavioral Model (1995) theoretically guided this study and logistic regression was used to examine factors associated with screening receipt and performance. **Results:** Study participants reported low screening rates, specifically mammography and CBE uptake. About 71% of the women had a mammography at least once in their lifetime, while about 36% indicating receipt of a mammogram in the last three years. About 59% of the women received a CBE at least once in their lifetime, while about 32% had CBE in the past three years. About 74% of study participants have performed BSE at least once in their life time, while about 68% have done it in the past three years. Knowledge of screening method was consistently correlated with participant's three breast cancer screening uptake. Additional factors that were positively associated with screening included older age, low barriers to mammograms, and lower educational attainment. **Conclusions:** Overall, study participants reported low rates of breast cancer screening receipt and performance. It is required to promote screening uptake among Korean immigrant women, especially women with young age, a lower level of education, and lack of health accessibility. A community-based language-appropriate health education program should be developed to increase health care access.

Keywords: Breast cancer- mammography- clinical breast exam- breast self-examination- Korean immigrant women

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Introduction

Korean immigrant women have among the highest breast cancer mortality rates (CDC, 2010) and lowest breast cancer screening rates of U.S. women across all racial/ethnic groups (McCracken et al., 2007). Studies showed that about 65.3% - 81% of Korean immigrant women ever had mammogram in their lifetime and 42% - 45.3% had one in the past two years (Juon et al., 2004; Lee et al., 2015). Similarly, Korean immigrant women reported low Clinical Breast Exam (CBE) receipt as well as Breast Self-Exam (BSE) performance rates. Around 64% of Korean immigrant women had CBE at least once in their life time and 54% had in the past two year (Lee et al., 2015) and 46.3% ever had practiced BSE monthly (Lee et al., 2006).

To improve screening rates, studies have identified factors associated with mammogram receipt in Korean immigrant women such as socio-demographic characteristics (e.g., age and marital status), access to health care (e.g., health insurance), social support, and health beliefs (Choi et al., 2017; Lee et al., 2016; Lee et al., 2015). Some of the factors associated with

mammography appeared to be associated with CBE such as regular check-up and perceived susceptibility (Lee et al., 2006; Lee et al., 2015). Lastly, marital status and regular check-up were significantly associated with BSE in Korean immigrant women (Lee, et al., 2006).

Most these studies focused on examination of mammography uptake among Korean immigrant women with a few exceptions (Choi et al., 2017; Lee et al., 2006). This may be because mammography is known as the primary method for early detection of breast cancer. In addition, both CBE and BSE techniques remain controversial with current recommendations due to insufficient evidence of its effectiveness in preventing breast cancer. However, researchers noted that CBE and BSE could play important roles for breast cancer diagnosis (Ma et al., 2012). Therefore, this study aims to investigate breast cancer screening rates and its associated factors to inform future intervention strategies, using three breast cancer screening methods of mammogram, CBE, and BSE.

Theoretical Framework

The Andersen's Behavioral Model of Health Care

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Utilization (Andersen, 1995) theoretically guided this study, which has been widely used in studies on cancer screening behavior. According to the model, individuals' use of health services is determined by a complex pattern of interaction among predisposing, enabling, and need characteristics; predisposing characteristics include exogenous factors like demographic characteristics, social structural variables, and health beliefs; enabling characteristics reflect conditions making health resources available to individuals such as accessibility and use of information sources; need characteristics include perceived needs and evaluated illnesses to motivate individuals to seek assistance or cause behavioral changes to maintain their health (Anderson, 1995).

Materials and Methods

Research Design and Data Collection

This study employed a cross-sectional study design, using baseline data from a mobile phone application-based mammogram intervention trial, "mMammogram." The trial was developed to promote mammogram uptake in Korean immigrant women in Midwest area. Further details of the mMammogram have been reported elsewhere (Lee et al., under review).

A total 168 Korean immigrant women aged 40 - 79 completed the baseline survey through face-to-face interviews. For recruitment, flyers in Korean language were distributed at various community-based sites. The questionnaires were developed in English and then translated into Korean using a back-translation method. Participants completed the questionnaire in their preferred language and they received \$20 for their time commitment.

Measures

Dependent variable. The dependent variable was self-reported receipt for BSE, CBE, and mammogram. Participants indicated if they have ever done or received a given test in their lifetime (1=Yes, 0=No).

Independent variables. Based upon Andersen's Behavioral Model, the following three factors were employed as primary predictors in this study: (1) predisposing, (2) enabling, and (3) need factors. Firstly, predisposing factors included age (in years), perceived barriers, and distrust towards health professionals. The perceived barriers were measured by 16 items, 11 of which were adopted from Champion's Health Belief Model (HBM) Scale (Champion, 1993; Champion, 1999). The distrust towards health professionals were measured by five items (e.g. "Health professionals are not compassionate for what their patients are going through"). All items were on a 4-point scale ranging from strongly disagree to strongly agree with higher item score indicative of stronger belief for the given construct. The scores of each construct were computed by the sum of item scores. The internal consistencies of barriers and distrust for the present sample were 0.91 and 0.77, respectively. Secondly, enabling factors included self-reported education (in years), health insurance (Yes/No), and procedure knowledge on how a given breast cancer screening test is conducted (Yes/No). Finally, need factors included

self-rated health status (1 = very bad ~ 5 = very good), self-reported cancer history (Yes/No), and family cancer history (Yes/No).

Data Analysis

In order to examine the extent to which the three sets of factors uniquely contribute to predicting a particular breast cancer screening type, a hierarchical logistic regression analysis was conducted. Additionally, time since the last receipt of each screening test was summarized by age groups in order to examine the differences between age cohorts in frequencies of receiving each test. Data were analyzed using IBM SPSS Statistics Version 22.

Results

Socio-Demographic Characteristics

The mean age of the participants was 52.40 (SD=10.01). On average, they lived in the U.S. for 18.52 years (SD=10.98). Their average education period was 15.03 years (SD=3.31). More than three-quarters of participants (77%) had health insurance. Approximately 52.4% and 26.8% reported they had fair and good health, respectively. A considerable number of participants reported a history of cancer (19%) and a family history of cancer (48.2%).

Breast Cancer Screening Rates by Age and Time Frame

Table 1 shows the breast cancer screening rates by age and time frame.

Mammography. About 71% (n=120) of the study participants received mammography at least once in their life time, whereas about 29% (n=48) never received mammography. Women ages 60 years and older had highest mammography receipt rates (84.2%) while women ages 40-49 years old had the lowest mammogram rate (58.8%) in their life time.

CBE. The CBE receipt rate was much lower than the mammography receipt or BSE performed rate such that only 58.9% (n=99) of the sample received a CBE at least once in their life time, indicating that 40.5% (n=68) never received CBE. Women ages 40-49 years old had highest CBE receipt rates (62.5%) while women ages 50-59 years and older had the lowest mammogram rate (52%) in their lifetime.

BSE. About 74% (n=124) of the sample conducted a BSE at least once in their life time, whereas about 24% (n=40) never done BSE. Women ages 60 years and older had highest BSE performance rates (76.3%) while women ages 40-49 years old had the lowest rate (71.3%) in their lifetime.

Hierarchical Binary Logistic Regression

Table 2 summarizes the results of the hierarchical logistic regression for each type of breast cancer screen test.

Mammography. Age (odds ratio = 1.08, p = 0.03), barriers to breast cancer screening (odds ratio=0.87, p =0.003), education (odds ratio = 0.77, p =0.03), and knowledge of mammography procedure (odds ratio = 105.47, p <0.001) significantly predicted having a

Table 1. Receipt of Breast Cancer Screening by Age and Time Frame (N=168)

| | Years since the last receipt | Age | | | All |
|-------------|------------------------------|--------------|--------------|------------|-------------|
| | | 40-49 (n=80) | 50-59 (n=50) | 60+ (n=38) | |
| Mammography | Yr <1 | 0 (0.0%) | 1 (2.0%) | 1 (2.6%) | 2 (1.2%) |
| | 1<=Yr <2 | 3 (3.8%) | 7 (14.0%) | 5 (13.2%) | 15 (8.9%) |
| | 2<=Yr <3 | 18 (22.5%) | 9 (18.0%) | 17 (44.7%) | 44 (26.2%) |
| | Yr >=3 | 26 (32.5%) | 23 (46.0%) | 9 (23.7%) | 58 (34.5%) |
| | Sub Total | 47 (58.8%) | 40 (80.0%) | 32 (84.2%) | 119 (70.8%) |
| | Never received mammography | 33 (41.3%) | 10 (20.0%) | 5 (13.2%) | 48 (28.6%) |
| | Total | 80 (100.0%) | 50 (100.0%) | 37 (97.4%) | 167 (99.4%) |
| CBE | Yr <1 | 2 (2.5%) | 4 (8.0%) | 1 (2.6%) | 7 (4.2%) |
| | 1<=Yr <2 | 8 (10.0%) | 6 (12.0%) | 4 (10.5%) | 18 (10.7%) |
| | 2<=Yr <3 | 14 (17.5%) | 8 (16.0%) | 7 (18.4%) | 29 (17.3%) |
| | Yr >=3 | 26 (32.5%) | 8 (16.0%) | 11 (28.9%) | 45 (26.8%) |
| | Sub Total | 50 (62.5%) | 26 (52.0%) | 23 (60.5%) | 99 (58.9%) |
| | Never received CBE | 30 (37.5%) | 24 (48.0%) | 14 (36.8%) | 68 (40.5%) |
| | Total | 80 (100.0%) | 50 (100.0%) | 37 (97.4%) | 167 (99.4%) |
| BSE | Yr <1 | 30 (37.5%) | 21 (42.0%) | 20 (52.6%) | 71 (42.3%) |
| | 1<=Yr <2 | 18 (22.5%) | 11 (22.0%) | 3 (7.9%) | 32 (19.0%) |
| | 2<=Yr <3 | 6 (7.5%) | 3 (6.0%) | 3 (7.9%) | 12 (7.1%) |
| | Yr >=3 | 3 (3.8%) | 3 (6.0%) | 3 (7.9%) | 9 (5.4%) |
| | Sub Total | 57 (71.3%) | 38 (76.0%) | 29 (76.3%) | 124 (73.8%) |
| | Never done BSE | 22 (27.5%) | 10 (20.0%) | 8 (21.1%) | 40 (23.8%) |
| | Total | 79 (98.8%) | 48 (96.0%) | 37 (97.4%) | 164 (97.6%) |

mammogram in their lifetime.

CBE. The distrust of health professionals (odds ratio = 0.71, $p = .01$), education (odds ratio = 0.82, $p = .03$), knowledge of CBE procedure (odds ratio = 28.77, $p < .001$), and family cancer history (odds ratio = 2.55, $p = .04$) were significantly associated with CBE receipt.

BSE. For predicted performance of BSE, having health insurance (odds ratio = 0.20, $p = .01$) and knowledge of the BSE procedure (odds ratio = 7.34, $p < 0.001$) were statistically significant.

Discussion

Using three breast cancer screening methods, the current study examined screening rates and its associated factors (i.e., predisposing, enabling, and need factors) in Korean immigrant women. Overall, study participants reported low screening rates, specifically when recent screening was taken into account.

This study found that a few predisposing factors predicted mammography uptake and CBE utilization, including age, perceived barriers and distrust toward health professionals. No predisposing factors were associated with BSE practice. In terms of factors associated with mammogram use, older Korean immigrant women were more likely to receive a mammogram in their lifetime. We also found Korean immigrant women who had low perceived barriers to mammography were more likely to have mammography, which is consistent with the findings of previous studies (Eun et al., 2009; Lee et al., 2015).

With respect to a predisposing factor related to CBE utilization, Korean immigrant women who distrusted health care professionals were less likely to receive CBE. It is well known that trust in physicians and/or health care system is associated with seeking timely medical care and maintaining appropriate health care (Yang et al., 2011). This implies that Korean immigrant women may need well-established trust relationship with health care professionals when it comes to CBE given that health providers perform CBE using hands. Given that health care providers' role is critical in cancer prevention and screening among minority women (Kim et al., 1997), further research is suggested to explore the association between trust in health care professionals and CBE utilization uptake.

Of enabling factors, Korean immigrant women who knew the procedure of each screening method and guideline were more likely to receive mammogram and CBE, as well as practice BSE. Previous studies support the positive effects of knowledge of mammography on its uptake (Juon et al., 2004). Similarly, Risendal et al., (1999) reported knowledge on the procedure of CBE was positively associated with CBE utilization.

Another enabling factor, educational attainment, was a significant predictor of mammography uptake and CBE utilization in this study. Korean immigrant women who had a lower educational attainment were more likely to get mammography and utilize CBE. It is likely that Korean women with a higher level of education in our study may be more concerned of radiation exposure during mammography, which may function as a barrier to

Table 2. Hierarchical Binary Logistic Regression Analysis for Variables Predicting Performance/Receipt of Breast Cancer Screening (N = 168)

| Factors | Variables | Model 1 | | | Model 2 | | | Model 3 | | |
|--------------|--------------------------|----------|------|----------------|---------|------|----------------|---------|------|----------------|
| | | B | SE B | e ^B | B | SE B | e ^B | B | SE B | e ^B |
| Mammography | | | | | | | | | | |
| Predisposing | Age | 0.07** | 0.02 | 1.07 | 0.07* | 0.04 | 1.07 | 0.08* | 0.04 | 1.08 |
| | Barriers | -0.11*** | 0.03 | 0.89 | -0.12** | 0.04 | 0.88 | -0.13** | 0.05 | 0.87 |
| | Distrust | -0.1 | 0.11 | 0.9 | -0.17 | 0.16 | 0.84 | -0.2 | 0.17 | 0.82 |
| Enabling | Education in years | | | | -0.25* | 0.11 | 0.78 | -0.26* | 0.12 | 0.77 |
| | Insurance | | | | 0.47 | 0.62 | 1.6 | 0.69 | 0.65 | 1.99 |
| | Knowledge of mammography | | | | 4.23*** | 0.72 | 69.06 | 4.66*** | 0.82 | 105.47 |
| Need | Health status | | | | | | | -0.42 | 0.36 | 0.66 |
| | Cancer history for self | | | | | | | 1.2 | 0.78 | 3.34 |
| | Family cancer history | | | | | | | 0.42 | 0.57 | 1.52 |
| CBE | | | | | | | | | | |
| Predisposing | Age | -0.01 | 0.02 | 0.99 | -0.02 | 0.02 | 0.98 | -0.01 | 0.03 | 0.99 |
| | Barriers | -0.05 | 0.03 | 0.95 | -0.04 | 0.03 | 0.96 | -0.03 | 0.03 | 0.97 |
| | Distrust | -0.20* | 0.1 | 0.82 | -0.31* | 0.12 | 0.73 | -0.34** | 0.13 | 0.71 |
| Enabling | Education in years | | | | -0.18* | 0.08 | 0.84 | -0.19* | 0.09 | 0.82 |
| | Insurance | | | | 0.27 | 0.5 | 1.32 | 0.35 | 0.52 | 1.43 |
| | Knowledge of CBE | | | | 3.20*** | 0.5 | 24.47 | 3.36*** | 0.53 | 28.77 |
| Need | Health status | | | | | | | 0.03 | 0.3 | 1.03 |
| | Cancer history for self | | | | | | | 0.49 | 0.58 | 1.64 |
| | Family cancer history | | | | | | | 0.94* | 0.46 | 2.55 |
| BSE | | | | | | | | | | |
| Predisposing | Age | 0.01 | 0.02 | 1.01 | 0.03 | 0.03 | 1.03 | 0.04 | 0.03 | 1.04 |
| | Barriers | -0.06* | 0.03 | 0.94 | -0.04 | 0.03 | 0.96 | -0.05 | 0.04 | 0.95 |
| | Distrust | 0.01 | 0.1 | 1.01 | -0.02 | 0.11 | 0.98 | -0.02 | 0.11 | 0.98 |
| Enabling | Education in years | | | | 0.12 | 0.08 | 1.13 | 0.15 | 0.09 | 1.16 |
| | Insurance | | | | -1.64* | 0.64 | 0.19 | -1.63* | 0.65 | 0.2 |
| | Knowledge of BSE | | | | 1.92*** | 0.48 | 6.82 | 1.99*** | 0.5 | 7.34 |
| Need | Health status | | | | | | | -0.16 | 0.29 | 0.85 |
| | Cancer history for self | | | | | | | 0.82 | 0.6 | 2.27 |
| | Family cancer history | | | | | | | 0.4 | 0.43 | 1.49 |

*p < 0.05; **p < 0.01; ***p < 0.001

the receipt of mammography. Similarly, highly educated women are more likely to be aware of CBE's low accuracy in detecting a breast cancer so that less likely to receive CBE. Further studies are needed to explore how education attainment is linked to the receipt of mammogram and CBE utilization by adopting qualitative research method.

Lastly, health coverage predicted BSE practice. Korean immigrant women who did not have insurance were more likely to perform BSE, which is consistent with previous studies (Lee et al., 2006; Ma et al., 2012). This finding implies that those women who are not insured may be more concerned about their breast health because they lack accessibility to CBE or mammography which requires health insurance coverage or knowledge on available free breast cancer screening programs.

Of need factors, only cancer history of family members was associated with CBE utilization in this study. Several studies have examined breast cancer screening behaviors in women with a family history of cancer (Ochoa et al.,

2010; Walker et al., 2013), but these were focused on mammogram use. However, no significant association was found with CBE in previous studies.

This study is not without limitations. First, the findings of this study may not be generalized to Korean immigrant women residing in different geographical areas due to its use of convenient sample in Midwest. Second, some participants might response to some of the survey items in a manner in which they considered more socially acceptable.

Despite these limitations, the findings of this study suggest implications to reduce breast cancer screening disparities in Korean immigrant women. Study findings report overall low rates of recent breast cancer screening uptake and performance. There is an urgent need for education on breast cancer prevention among Korean immigrant women, particularly those with a higher level of barriers and younger age. To promote breast cancer screening in this population, a community-based and

language appropriate health education program involving some forms of cultural strategies (e.g., trust issues in health care professionals) should be developed combined with strategies to increase health care access such as bilingual screening services or assistance of scheduling for screening and transportation.

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