

Effects of Perceived Discrimination and Trust on Breast Cancer Screening among Korean American Women

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Objective: Korean American (KA) women continue to have lower breast cancer screening rates than other racial groups. Perceived discrimination and trust have been associated with breast cancer screening adherence, but little is known about the associations in KA women.

Methods: Surveys were completed by 196 Korean American women in the Chicago metropolitan area. Multiple and firth logistic regression analyses were performed to identify factors (perceived discrimination, trust, acculturation, cultural beliefs, healthcare access) influencing breast cancer screening adherence (mammogram). In addition, SPSS macro PROCESS was used to examine the mediating role of trust between perceived discrimination and breast cancer screening adherence.

Results: Ninety-three percent of the women surveyed had health insurance and 54% reported having a mammogram in past 2 years. Predictors of having a mammogram were knowing where to go for a mammogram, having a regular doctor or usual place for healthcare, higher trust in healthcare providers, and lower distrust in the healthcare system. Perceived discrimination had an indirect effect on breast cancer screening through trust.

Conclusions: The breast cancer screening rate among KA women is low. Perceived discrimination in healthcare, trust in healthcare providers, and distrust in the healthcare system directly or indirectly influenced breast cancer screening adherence in KA women. Trust is a factor that can be strengthened with educational interventions.

The stage of breast cancer at diagnosis is a critically important determinant of health outcomes and survival rate, and regular mammography is the only known effective method to detect breast cancer (Siu & U.S. Preventive Services Task Force [USPSTF], 2016). Among Korean American (KA) women, breast cancer is the most commonly diagnosed cancer, and incidence rates steadily increased from 53.5 per 100,000 individuals in 1998 to 2002 (Miller, Chu, Hankey, & Ries, 2008) to 68.0 per 100,000 individuals in 2006 to 2010 (Torre et al., 2016). However, the level of guideline-concordant breast cancer screening (mammography in the past 2 years) did not rise above 65% in the 1998 to 2014 time period (Choi et al., 2010; Juon, Choi, & Kim, 2000; Juon, Kim, Shankar, & Han, 2004; Juon, Seo, & Kim, 2002; Lee, Strange, & Ahluwalia, 2014; Maxwell, Bastani, & Warda, 2000; Wismer et al., 1998; Yu, Hong, & Seetoo, 2003). These screening rates are below the level of guideline-concordant breast cancer screening for Asian American women (68%) and well below the Healthy People 2020 goal of 81.1%; these screening rates place KA women at risk for detecting breast cancer in later stages (Lee et al., 2016). Previously, studies were conducted to identify factors influencing breast cancer screening among KA women such as socio-demographic characteristics, acculturation, health care access, and health beliefs. Yet, the findings are inconsistent and do not entirely explain why KA women underuse cancer screening services. There is a growing body of literature identifying that patients' perceptions of the patient-provider interaction, perceived discrimination, and trust are associated with cancer screening in the general population and minorities (Gonzales, Harding, Lambert, Fu, & Henderson, 2013; Hausmann, Jeong, Bost, & Ibrahim, 2008; Kressin, Raymond, & Manze, 2008; Musa, Schulz, Harris, Silverman, & Thomas, 2008; O'Malley, Sheppard, Schwartz, & Mandelblatt, 2004; Shavers et al., 2012). Among KAs, perceived discrimination and trust based on the patient-provider interaction and their influence on breast cancer screening is an understudied area that may be able to explain some of the low utilization of breast cancer screening among

KA women.

Perceived discrimination in healthcare is the belief that one has experienced unfair treatment in healthcare settings based on her or his race/ethnicity or socioeconomic status (Gonzales et al., 2013; Kressin et al., 2008). In a report on unequal treatment in American healthcare from the Institute of Medicine (Smedley, Stith, & Nelson, 2003), racial and ethnic discrimination were identified as having major causal roles in health care disparities and have been a consistent factor negatively affecting both mental and physical health. Perceived discrimination can be differentiated by an individual's experience of major lifetime discrimination, which might have happened many years ago, versus an individual's experience of everyday discrimination, which refers to more-recent events that might have happened more frequently than major lifetime discrimination (Ayalon & Gum, 2011; Bird & Bogart, 2001; Kessler, Mickelson, & Williams, 1999). According to Bird and Bogart (2001), perceived discriminatory acts from healthcare providers on a day-to-day basis are associated with lower health care utilization and poorer health outcomes. For example, Crawley, Ahn, and Winkleby (2008) examined the relationship between perceived discrimination in healthcare and screening rates for colorectal and breast cancers in African-American, American Indian, Asian, and Latino adults and identified that women who perceived discrimination had lower breast screening compared to women who did not perceive discrimination. Furthermore, Haywood et al. (2014) evaluated the association between perceived discrimination, non-adherence to physician recommendations, and the role of patient trust in 235 participants with sickle cell anemia and found that participants with higher levels of perceived discrimination from healthcare providers were more likely to report being non-adherent to physician recommendations. Also, the results showed that trust in healthcare providers mediated the discrimination and non-adherence relationship. However, several other studies also reported that perceived discrimination was not associated

with participation in breast cancer screening (Dailey, Kasl, Holford, & Jones, 2007; Shariff-Marco, Klassen, & Bowie, 2010; Trivedi & Ayanian, 2006), showing that this relationship is not always straightforward.

Trust is “the willingness of a party to be vulnerable to the actions of another party” (Mayer, Davis, & Schoorman, 1995, p.712). In healthcare, trust has been distinguished or categorized by the object of trust such as trust in the physician (interpersonal trust) and/or trust in the healthcare system (social trust), which is characterized by one’s attitude toward the collective healthcare related organization (Goold, 2002; Hall, Dugan, Zheng, & Mishra, 2001; Mechanic, 1998; Rose, Peters, Shea, & Armstrong, 2004). Studies have shown that minorities seem to have lower levels of trust in their healthcare providers and the healthcare system (Halbert, Armstrong, Gandy, & Shaker, 2006; Kaiser et al., 2011; Talcott et al., 2007), and these lower levels of trust adversely influence health service utilization and preventive screening. For example, a patient’s trust in their health care provider and the healthcare system were found to be strong predictors for breast cancer screening even when socioeconomic variables such as insurance, age, marital status, and education were controlled (Musa et al., 2009; O'Malley et al., 2004; H. S. Thompson, Valdimarsdottir, Winkel, Jandorf, & Redd, 2004; Yang, Matthews, & Hillemeier, 2011).

Perceived discrimination is a significant predictor of trust (Armstrong et al., 2013; Cuffee et al., 2013, Hammond, 2010; Jacobs et al., 2011; Ngo-Metzger, Legedza, & Phillips, 2004). Jacobs et al. (2011) found that African American and Hispanic participants reported expectations of discrimination as determinants of distrust in the healthcare system, whereas White participants did not. Armstrong et al. (2013) and Hammond (2010) reported that prior experience of racial discrimination was a strong determinant of distrust in the healthcare system in African Americans. Asian Americans displayed lower levels of trust when reporting that a family member or friend had been treated unfairly when seeking medical care

or that the doctors did not treat them with respect (Ngo-Metzger et al., 2004). Moreover, Cuffee et al. (2013) identified that in African Americans with hypertension, perceived discrimination was associated with medication nonadherence and that this association was partially mediated by trust in the physician.

Several socio-economic and cultural predictors for breast cancer screening among KA women have been identified in earlier studies. KA women who were older, married, employed, and who had insurance, a usual source of care, higher household income, and higher education levels were more likely to report breast cancer screening within the last 2 years (Juon, Choi, & Kim, 2000; Juon, Kim, Shankar, & Han, 2004; Lee, Ju, Vang, & Lunquist, 2010; Lew et al., 2003; Ryu, Crespi, & Maxwell, 2013; Wismer et al., 1998). KA women who resided in the U.S. longer and had better English language proficiency, indicating higher acculturation, were more likely to report breast cancer screening in the last 2 years (Juon et al., 2000; Juon et al., 2004; Juon, Seo, & Kim, 2002; Maxwell et al., 2000; Yu et al., 2003). KA women with Korean physicians were less likely to have breast cancer screening than those with non-Korean physicians (Juon et al., 2004; Lew et al., 2003), while patient-physician concordance was a significant predictor of breast cancer screening in Latinos and other Asian Americans (Eamranond, Davis, Phillips, & Wee, 2011; Thompson et al., 2014). Cultural beliefs are important factors since KA women are predominantly first-generation immigrants (Gryn & Gambino, 2012; E. E. Lee et al., 2016), and these beliefs directly influence health behaviors (Pasick, D'Onofrio, & Otero-Sabogal, 1996). However, cultural beliefs were not measured in most previous studies, and were inconsistent in influencing breast cancer screening among KA women in the two studies where they were measured (Suh, 2008; Lee, Kim, & Han, 2009). In this study, cultural beliefs specific to breast cancer were included.

Perceived discrimination and trust in healthcare providers and their relationships to breast cancer screening have not been studied in the KA population. The aim of this study was to identify factors, including perceived discrimination and trust in healthcare, that influence breast cancer screening adherence among KA women. The premise of the study is based on Betancourt's Integrative Model of Culture (perceived discrimination), Psychological Processes (trust in healthcare providers and healthcare system), and Behavior (breast cancer screening) (Betancourt & Flynn, 2009), and a thorough literature review on breast cancer screening adherence among KA women. Previous researchers have focused on specific elements such as the effect of either social, structural, cultural, or psychological factors as determinants of breast cancer screening adherence and have shown mixed findings of their relationship to adherence. One explanation for these mixed findings could be that the previous studies did not consider the possible interrelationships among factors associated with breast cancer adherence and the effect of patient-provider interaction. Betancourt's Integrative Model of Culture, Psychological Processes, and Behavior adapted for health behavior (Betancourt & Flynn, 2009) is unique in that it allows examination of the complex interrelationships among multiple phenomena relevant to patient-provider interaction and health behavior in culturally diverse patients. The specific aims of this study were to 1) describe the levels of perceived discrimination in healthcare, trust in healthcare providers, and trust in the healthcare system; 2) identify predictors of breast cancer screening (mammography); and 3) examine the indirect (mediation) effect of perceived discrimination on breast cancer screening (mammography) through trust. We hypothesized that KA women who have been screened for breast cancer with mammography when compared to KA women who have not screened will have higher levels of acculturation, lower levels of cultural beliefs, lower levels of perceived discrimination in healthcare, higher levels of trust in healthcare providers, and lower levels of distrust in the healthcare system. We also

hypothesized that perceived discrimination in healthcare will have an indirect effect on mammography through trust in the healthcare provider and trust in the healthcare system (Figure 1).

Materials and methods

Design, Sample and Settings

A cross-sectional survey design was used to examine the factors contributing to breast cancer screening adherence among KA women. The study population was a convenience sample of 196 KA women living in the Chicago metropolitan area who met the following eligibility criteria: 1) age between 50 to 74 years, 2) no history of cancer, and 3) able to read and understand either Korean or English. The participants were recruited from 4 Korean churches. Among KAs, studies reported that approximately 78% are first-generation (Korean-born) immigrants who are influenced by traditional Korean values (Gryn & Gambino, 2012; Park & Bernstein, 2008). Thus, the questionnaires were provided in both English and Korean; all women in this study preferred to answer in Korean. Upon completion of the questionnaire, each participant received \$10. Data collection began after obtaining approval from the Institutional Review Board (IRB) at the University of Illinois at Chicago.

Measures

Breast cancer screening adherence: The question related to breast cancer screening adherence was from recent U.S. Preventive Services Task Force guidelines (USPSTF, 2016). The USPSTF (2016) recommends that women aged 50 to 74 undergo biennial screening mammography (Siu & USPSTF, 2016). The participants were asked whether they received a mammogram in the past 2 years.

Acculturation: Acculturation was measured with a Short Acculturation Scale for Koreans (SAS-K) (S. E. Choi & Reed, 2011). SAS-K is a 12-item questionnaire that measures three dimensions of acculturation: a) language use and preference at work, at home, and with friends; b) language use and preference in media (TV and radio) programs; and c) preferred ethnicity of individuals in social relations. A score of 5 indicates high levels of acculturation and a score of 1 indicates little acculturation. In Korean Americans, the Cronbach's alpha for each subscale ranged from .80 to .95 and the overall Cronbach's alpha was .93, supporting internal consistency (Choi & Reed, 2011). In this study, the Cronbach's alpha was .90, with each subscale ranging from .73 to .86.

Ferrans Cultural Beliefs Scale: Cultural beliefs were measured by the Cultural Beliefs Scale (Ferrans et al., 2007). This scale was developed to assess cultural beliefs contributing to later stage breast cancer at diagnosis among Caucasian, African American, and Hispanic women. This scale consists of 17 items, answered true or false. Items include “If a breast lump is not painful, it is not cancer”, “Women with large breasts are more likely to get breast cancer than women with small breasts”, “If you have a breast lump, a natural remedy can help to get rid of it”, and “It doesn't really matter if you get treated for breast cancer, because if you get cancer, it will kill you sooner or later”. The total score ranges from 0 to 17, with higher scores indicating more cultural myths inhibiting screening. Internal consistency was supported with a Cronbach's alpha of .73 (Ferrans et al., 2007). Higher scores were related to longer delay in seeking evaluation of suspicious breast symptoms in the three cultural groups originally tested (Ferrans et al., 2007). Among first generation Muslim women, perceived barriers and cultural beliefs were moderately correlated ($r = .39, p < .001$), supporting construct validity (Hasnain, Menon, Ferrans, & Szalacha, 2014). This scale had not been used previously with

KAs. In this study, the Cronbach's alpha was .65, indicating a slightly low, but acceptable, internal consistency.

Perceived discrimination in healthcare: Perceived discrimination in healthcare was measured by Bird and Bogart's (2001) modified version of Williams' Everyday Discrimination Scale (Bird & Bogart, 2001; Williams, Yan, Jackson, & Anderson, 1997). The seven items on this scale are scored on a 5-point Likert scale. The total score ranges from 7 to 35, with higher scores indicating greater perceived discrimination. The Cronbach's alpha was .60 in Latinas, .94 in American Indians, and .89 in African Americans (Gonzales et al., 2013; Peek, Nunez-Smith, Drum, & Lewis, 2011; Sheppard et al., 2008). In this study, the Cronbach's alpha was .88, indicating support for internal consistency.

Trust in healthcare providers: The Trust in Physician (TIP) scale was developed by Anderson and Derrick (1990) to measure the level of interpersonal trust in the patient-physician relationship. The TIP consists of 11 items and each item is rated on a 5-point Likert scale. Items 1, 5, 7, and 11 are reverse coded and all items are summed to produce a total score (range=11 to 55). Higher scores indicate a higher trust in healthcare providers. Internal consistency was .90 in the original version and .84 in the Chinese version of TIP scale (Simon, Zhang, & Dong, 2014). This scale had not been used previously with KAs. In this study, the Cronbach alpha was .82, supporting the instrument's internal consistency.

Trust in healthcare system: Trust in the healthcare system was measured by the revised Health Care System Distrust (HCSD) scale (Shea et al., 2008). The scale consists of 9 items rated on a 5-point Likert scale, producing a possible distrust score ranging between 9 and 45; a higher score indicates more distrust (or less trust) in the healthcare system. The scale

consists of two subscales, (1) value distrust (5 items, Cronbach's $\alpha = .73$), and (2) competence distrust (4 items, Cronbach's $\alpha = .77$; Shea et al., 2008). This scale had not been used previously with KAs. In this study, the Cronbach's α was .83, indicating strong internal consistency.

Covariate variables: Covariate variables include participant characteristics and healthcare access variables: age, length of stay in US, education, marital status, income-the categorization was based on the recent study done with a similar sample (Park, 2012), employment, self-rated health (SRH), family history of breast cancer, and access related variables such as insurance, usual source of care (regular doctor/place), whether KA women knew where to go for mammogram, whether KA women were able received care where they wanted, and physician-patient concordance (Table 1).

Translation process

The Ferrans Cultural Beliefs, Perceived Discrimination in Healthcare, Trust in Physician (TIP), and the revised Health Care System Distrust (HCSD) scales had not been used in the KA population previously, and thus needed translation. The following procedures were used to assure accurate translation and content validity of the instruments: (1) committee-based translation with 3 bilingual Korean PhD students, (2) expert review by a nursing PhD professor who had experience in translating instruments and was familiar with the Korean and Western cultures, (3) cognitive interviews using translated scales to detect questionnaire items and words that were not understood by the participants as intended by the researcher, and (4) review of the translated scales by a bilingual expert for final confirmation that translated scales were clear and conceptually equivalent.

Analysis

All data analyses were conducted using Stata/IC version 12, SPSS 24, and SPSS PROCESS (SPSS, Inc, Chicago, IL). There were no missing data as the principal investigator and two research assistants were available to answer any questions and check for missing data during the survey collection. Descriptive statistics such as means, standard deviation, frequencies, and percentages were used to describe the sample. Multiple logistic regressions and first logistic regressions were completed to find predictors of breast cancer screening within the past 2 years. In the regression analysis, age, length of stay in US, acculturation, perceived discrimination in healthcare, cultural beliefs, trust in healthcare providers, and distrust in healthcare providers were entered as continuous variables. Marital status was dichotomized as not married and married, and education was dichotomized as high school or less and college or higher. Immigration status was dichotomized as non-citizen immigrants and naturalized citizens. Approximately 3% of participants selected either ‘undocumented immigrants’ or ‘decline to answer’ and were not included in the regression model. Income was divided into four categories and compared to the 2016 poverty line (\$24,999 dollars or less). Health status was dichotomized as fair/poor and good and above. Cut-offs to determine how the variables would be dichotomized were based on previous literature (Juon, et al., 2002; Lee et al., 2016; Lee, Fogg, & Sadler, 2006; Lee et al., 2014; Lee et al., 2012; Ma et al., 2012; Yang et al., 2011). The indirect effect of perceived discrimination on breast cancer screening (mammography) through trust was analyzed using SPSS macro PROCESS version 2.6 (Hayes, 2013).

Results

General Characteristics of the Participants

A convenience sample of 196 Korean American women between 50 and 74 years old

participated in the study. Fifty-four percent of participants reported having mammography in the past 2 years. Table 1 presents the demographic characteristics of the participants. The mean age of the 196 women was 63 ± 7 years (range, 50-74 years). More than 75% had lived in US for more than 20 years, with a mean length of stay of 29 ± 11 years (range, 2-54 years). Seventy-five percent of women were married and 59% were educated at the college or higher level. Approximately one-third of the women reported household earnings above \$40,000 and 24 % earned less than \$25,000 per household. The majority (85%) had a regular doctor or a regular place they could go for health care, and 88% reported the ethnicity of their doctors was Korean. Most of the KA women sampled (92%) responded that they were able to find a Korean doctor/healthcare provider if they wanted one. Ninety-three percent had health insurance, 72% reported that they were able to receive healthcare where they wished, and 70% knew where to go for a mammogram that would accept their insurance (Table 1). Table 2 presents the mean scores for acculturation, cultural beliefs, perceived discrimination, trust in healthcare providers, and distrust in the healthcare system. Acculturation in the screened group was higher compared to the not screened group ($p = .024$). The overall cultural beliefs mean scores were low. Cultural beliefs and perceived discrimination were lower in the screened group compared to the not screened group ($p = .004$ and $p < .001$ respectively). Trust in healthcare providers was higher in the screened group compared to the not screened group ($p < .001$), and distrust in the healthcare system was lower in the screened group compared to the not screened group ($p < .001$).

Predictors of breast cancer screening (mammography) in past 2 years

Multiple logistic regressions were completed to identify predictors of breast cancer screening (mammography). The overall regression model examining predictors of screening in the past 2 years was significant ($LR \chi^2 = 102.15$; $p < .001$). Having regular doctors or

having regular places for health care was a strong predictor in this model. The odds of having mammograms among women who had regular doctors or regular places for health care were approximately 30 times greater than those of women who did not have regular doctors or regular places for health care (odds ratio [OR], 29.91; 95% CI, 3.75-238.13). Also, the odds of having mammograms among women who knew where to go for a mammogram were approximately 7 times greater than those of women who did not know where to go for a mammogram (OR, 6.49; 95% CI, 1.61-26.14). Both trust in healthcare providers and distrust in the healthcare system were significant predictors of being screened within the past 2 years. Holding other variables constant, for every one-point increase in trust in healthcare providers, the odds of having a mammogram increased by 14% (OR, 1.14; 95% CI, 1.01-1.29). Conversely, the odds of having a mammogram decreased by 16% with every one-point increase in distrust in healthcare system (OR, 0.84; 95% CI, 0.72-0.99). Acculturation, cultural beliefs, and perceived discrimination were not significant predictors of screening in this model (Table 3). Hosmer and Lemeshow's goodness-of-fit test was not significant ($p > .05$), indicating the models fit the data well. The assumption of lack of multicollinearity was met because the VIF values of all variables were less than 10 (mean variance inflation factor 1.82), and the values of tolerance were greater than 0.1.

In addition to multiple logistic regression, Firth logistic regression was performed to address the issues of biased estimates due to small cell size. The problem of the maximum likelihood estimation of logistic regression is that it may result in small-sample bias (high OR) and the bias is strongly related to a small sample size in certain cells (King & Zeng, 2001; Williams, 2016). The results were similar to the multiple logistic regression. The major differences were that the odds of having mammograms among women who had regular doctors or regular places for healthcare were approximately 14 times greater than those of women who did not have regular doctors or regular places for health care (OR, 13.50; 95%

CI, 2.77-113.71), and the odds of having mammograms among women who knew where to go for a mammogram were approximately 4 times greater than those of women who did not know where to go for a mammogram (OR, 3.59; 95% CI, 1.08-12.95; Table 3).

Indirect effect of perceived discrimination on breast cancer screening (mammography) through trust

In this study, the direct effect of perceived discrimination was not significant ($c^i = -.05, p = .324$, 95% CI, -0.17 to 0.07). However, the indirect effect of perceived discrimination in healthcare on screening through trust (trust in healthcare provider and distrust in healthcare system combined) was significant ($ab = -0.18$, 95% CI, -0.27 to -0.03). This indirect effect was determined by adding the mediating effect of trust in healthcare providers and distrust in healthcare system ($-0.78 \times 0.11 = -0.09$ and $0.62 \times -0.14 = -0.09$). Specifically, the higher levels of perceived discrimination decreased trust in health care providers ($ai = -0.78; p < .001$), and increased distrust in healthcare system ($aii = 0.62; p < .001$). In turn, trust in healthcare providers increased screening ($bi = 0.11; p < .05$), and distrust in the healthcare system decreased screening ($bii = -0.14; p < .05$) (Figure 2).

Discussion

The purpose of this study was to identify factors including perceived discrimination, trust in healthcare providers, and distrust in the healthcare system, that influence breast cancer screening adherence among KA women aged 50 to 74 years. The major findings from this study were that 1) having regular doctors or places for healthcare, knowing where to go for a mammogram, higher trust in healthcare providers, and lower distrust in healthcare system were predictors of being screened in the past 2 years; and 2) perceived discrimination had an indirect effect on breast cancer screening in the past 2 years through trust in healthcare

providers and distrust in the healthcare system.

The rate of screening in the past 2 years was low in this study (54%). This finding is consistent with previous studies that revealed low screening rates in the past 2 years among KA women (Choi et al., 2010; Kagawa-Singer et al., 2007; Pourat, Kagawa-Singer, Breen, & Sripipatana, 2010). This rate is also lower than Asian Americans in general nationally (68%; American Cancer Society, 2016b), and the overall U.S. population (72%; American Cancer Society, 2016a). Moreover, the screening rates among KA women appeared to be far below the Healthy People 2020 goal of 81% and place KA women at risk for late-stage detection of breast cancer. In other studies, interventions incorporating acculturation, health beliefs, and knowledge of breast cancer screening in KA women (Heo & Braun, 2014; Lee, 2015) have not always been effective in increasing screening. Our study findings suggest that incorporating additional factors such as trust may be promising for promoting greater screening among KA women.

Consistent with previous reports, access to health care was a strong predictor for breast cancer screening (Lee et al., 2006; Lee et al., 2016). In this study, women who had a usual source of care (regular doctor/regular place for healthcare) and who knew where to go for a mammogram were significantly more likely to engage in breast cancer screening. Research supports that poor access to healthcare providers is the most important reason for patients not to have cancer screening (Schueler, Chu, & Smith-Bindman, 2008). If women have a usual source of healthcare, they are more likely to be reminded of and referred for mammogram screening, according to current standards of care.

Although having insurance has been a strong predictor for breast cancer screening among KA women (Choi et al., 2010; Eun, Lee, Kim, & Fogg, 2009; Juon et al., 2004; Juon et al., 2002; Lew et al., 2003; Yu et al., 2003), it was not a predictor of breast cancer screening in this study. It should be noted however that this sample was highly insured

(93%), so these results may not provide an adequate examination of lack of insurance. However, this study does provide an examination of the factors influencing breast cancer screening in KA women under the most favorable circumstances in terms of insurance, showing other variables amenable to effective interventions.

The positive patient-provider interaction is a cornerstone to build trust and may lead to improvement in healthcare utilization, including breast cancer screening. Other studies have shown that lack of trust in the provider is related to increased patient delay or missed appointments and non-compliance with preventive screenings (Hammond, 2010; Mollborn, Stepanikova, & Cook, 2005; Musa et al., 2009; O'Malley et al., 2004). In this study, KA women with higher levels of trust in healthcare providers were more likely to be adherent to breast cancer screening. Increasing trust between patients and healthcare providers is an important way to promote the cancer screening adherence. Understanding facilitators of trust can better inform the design of interventions for KA women with the ultimate goal of improving breast cancer screening.

Consistent with previous research related to trust/distrust in the healthcare system and cancer screening adherence in other minorities (Katapodi, Pierce, & Facione, 2010; Yang et al., 2011), participants with higher distrust in the healthcare system were less likely to be compliant with breast cancer screening guidelines in this study. Qualitative studies to explore and understand specific reasons for distrust in the healthcare system would be beneficial to develop interventions to decrease distrust in the healthcare system among KA women.

In this study, perceived discrimination in healthcare was not a direct predictor of screening. We hypothesized that perceived discrimination in healthcare would have an indirect effect on mammography through trust in the healthcare provider and trust in the healthcare system. The results of our mediation analysis provide evidence to support this hypothesis. Discriminatory experiences in healthcare settings were associated with lower

trust levels, and in turn lower trust levels were associated with lower breast cancer screening adherence. Our findings are consistent with previous findings that trust may be an important factor explaining the relationship between discrimination and health in other minorities (Cuffee et al., 2013; Haywood et al., 2014).

Limitations

The convenience sampling and cross-sectional design limit generalizability of the study findings and do not allow for identification of causal relationships among study variables. Since all participants were recruited from the churches, the study sample overrepresented Christians. Also, this sample may be more representative of women who feel more affiliation with the Korean culture than those who attend non-Korean churches or do not attend church at all.

Four scales used in this study were not previously validated in the Korean population. We conducted a rigorous translation process to ensure content validity, and each scale had an acceptable Cronbach's alpha. Future studies examining the psychometric properties of these scales in similar samples are needed to further support their validity.

Our dependent variable was self-reported breast cancer screening and not actual screening records. Previous literature reported that people tend to over-report screening and actual screening rates may be lower (Ferrante et al., 2008; Rauscher, Johnson, Cho, & Walk, 2008). Future studies may need to obtain objective screening data for accuracy.

In the multiple logistic model, the odds of having mammograms among women who had regular doctors or regular places for health care were approximately 30 times greater than those of women who did not have regular doctors or regular places for health care (OR, 29.91; 95% CI, 3.75-238.13). The high OR and wide confidence interval were most likely due to the small sample size in each cell (85% reported they had regular doctors or places,

and 15% reported they did not have regular doctors or places; King & Zeng, 2001; Williams, 2016). Although we used a sophisticated statistical method, first logistic regression to adjust for this shortcoming, a larger sample would be beneficial to confirm the study results in the future.

Implications for Practices and/or Policy

Major study findings suggest several areas for future research. As mentioned earlier, this study is the first study to examine perceived discrimination in healthcare, trust in healthcare providers, distrust in the healthcare system, and breast cancer screening in KA women, and may not fully explain their relationships. Additional studies using a larger sample and prospective data collection longitudinally would be needed to confirm the study findings, causality, and generalizability.

Trust was found to influence breast cancer screening directly as seen in the regression model, and also was a mediator between perceived discrimination and breast screening in the past 2 years. Trust is a factor that can be strengthened with educational interventions (Clancy et al., 2003; Thompson, Gee, Larson, Kotz, & Northrop, 2001; Tulskey et al., 2011). Intervention programs to increase trust in healthcare providers or groups of healthcare providers include improving communication skills of healthcare providers (e.g., encouraging a patient-centered approach including shared decision-making and showing empathy), emphasizing confidentiality, demonstrating the provider's technical competence (e.g., by advertising the healthcare provider's qualifications), improving continuity of care, and improving access to care (patients trust doctors who are readily available; Rolfe, Cash-Gibson, Car, Sheikh, & McKinstry, 2014). However, not all interventions were effective in increasing trust and changing health behaviors. The interventions developed for KA women should be culturally sensitive and incorporate specific needs of this population. Qualitative

research to explore and understand the root cause of why KA women express such a low trust level would be beneficial to develop future interventions.

Last, this study demonstrated that the perceived experience of discrimination and low trust in the healthcare setting are associated with reduced likelihood of breast cancer screening among KA women. These perceptions may have negative influence on other cancer screenings as well, such as colorectal cancer screening and cervical cancer screening. In addition, these may also influence other health behaviors negatively, such as medication adherence, health care utilization, and self-care in chronic illness. Thus, our study may help to lay the groundwork for future research related to patient-provider interaction and promoting positive health behaviors in general among KA women.

Conclusions

The breast cancer screening rate among KA women was found to be low. Perceived discrimination in healthcare, trust in healthcare providers, and distrust in the healthcare system directly or indirectly influenced breast cancer screening adherence in KA women. Results from this research have important implications for outreach, clinical practice, and research aimed at the elimination of breast cancer screening disparities in KA women.

Table 1. Descriptive Statistics of the Participants (N=196)

Variables	Mean (SD) or n	%
Age (y)	62.7 (6.78)	-
Range	50-74	
Duration of stay in US (y)	28.8 (11.32)	-
Range	2-54	
Immigration status		
Naturalized citizen	156	79.6
Non-citizen	34	17.4
Undocumented	3	1.5
Decline to answer	3	1.5
Marital status		
Married	147	75.0
Not married	49	25.0
Employment		
Part-time	27	13.8
Full-time	60	30.6
Not working	109	55.6
Education		
High school or less	80	40.8
College or higher	116	59.2
Income (US\$)		
<10,000	18	9.2
10,000-24,999	28	14.3
25,000-39,999	44	22.5
40,000-54,999	22	11.2
55,000 or more	51	26.0
Don't know	15	7.6
Decline to answer	18	9.2
Regular doctor/healthcare providers		
Yes	166	84.7
No	30	15.3
Physician race		
Korean	173	88.3
Non-Korean	23	11.7
Able to find Korean physician		
Yes	181	92.4
No	15	7.6
Able to receive care where wanted		
Yes	141	71.9
No	55	28.1

Table 1. Descriptive Statistics of the Participants (n=196) (continued)

Variables	Mean (SD) or n	%
Know where to go for mammogram		
Yes	138	70.4
No	58	29.6
Insurance		
Private	77	39.3
Affordable Care Act	34	17.4
Medicare	19	9.7
Medicaid	12	6.1
Medicare/Medicaid	20	10.2
Medicare/Private	21	10.7
No insurance	13	6.6
Health status		
Excellent	10	5.1
Very good	43	21.9
Good	100	51.0
Fair	36	18.4
Poor	7	3.6
Family history of breast cancer		
Yes	40	20.4
No	156	79.6

Abbreviation: SD, standard deviation.

Table 2. Descriptive Statistics and Screening (n=196)

Variables	Screened in past 2 years				p
	Yes (n=106)		No (n=90)		
	M (SD)	Range	M (SD)	Range	
Acculturation	1.7 (.67)	1-3.8	1.5 (.47)	1-2.9	.024
Cultural beliefs	2.2 (1.99)	0-10	3.1 (2.50)	0-9	.004
Perceived discrimination	10.6 (3.32)	7-23	16.2 (6.15)	7-28	<.001
Trust in healthcare providers	39.1 (5.40)	27-55	30.5 (6.79)	16-46	<.001
Distrust in healthcare system	22.9 (4.31)	11-32	29.5 (5.71)	13-42	<.001

Abbreviation: SD, standard deviation.

Note: The *p*-value calculated by the two-sample t test

Table 3. Logistic regression models predicting screening in past 2 years (n=159)

Variables	Multiple logistic regression		Firth logistic regression	
	OR	95% CI	OR	95% CI
Age	0.94	0.84-1.04	0.94	0.85-1.03
Length of stay in US	0.96	0.89-1.03	0.97	0.90-1.03
Immigration status (Ref: Non-citizen)				
Naturalized immigrants	3.54	0.53-23.6	2.97	0.52-17.2
Marital status (Ref: Not married)				
Married	1.52	0.39-5.97	1.24	0.34-4.17
Education (Ref: High school or less)				
> High school	0.79	0.28-2.01	0.89	0.33-2.04
Income (Ref: 24,999 or less)				
25,000-39,999	1.33	0.31-5.85	1.24	0.33-4.80
40,000-54,999	0.20	0.13-5.07	0.83	0.16-4.09
55,000 or more	0.41	0.07-2.27	0.46	0.09-2.05
Regular doctor/place (Ref: No)				
Yes	29.91***	3.75-238.13	13.50***	2.77-113.71
Physician race (Ref: Non-Korean)	1.33	0.24-7.49	1.34	0.30-6.24
Finding Korean doctor/healthcare providers	1.78	0.06-9.47	0.63	0.07-5.46
Insurance (Ref: No insurance)	25.81	0.69-1098.59	9.30	0.52-312.62
Know where to go for mammogram	6.49***	1.61-26.14	3.59**	1.08-12.95
Acculturation	1.09	1.00-1.20	1.07	0.99-1.16
Cultural beliefs	1.08	0.84-1.40	1.08	.87-1.37
Perceived discrimination	0.96	0.84-1.40	0.96	0.84-1.40
Trust in healthcare providers	1.14*	1.01-1.29	1.11**	1.00-1.25
Distrust in healthcare system	0.84*	0.72-.99	0.87**	0.76-0.99

Abbreviation: OR=odd ratio; CI=confidence interval

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

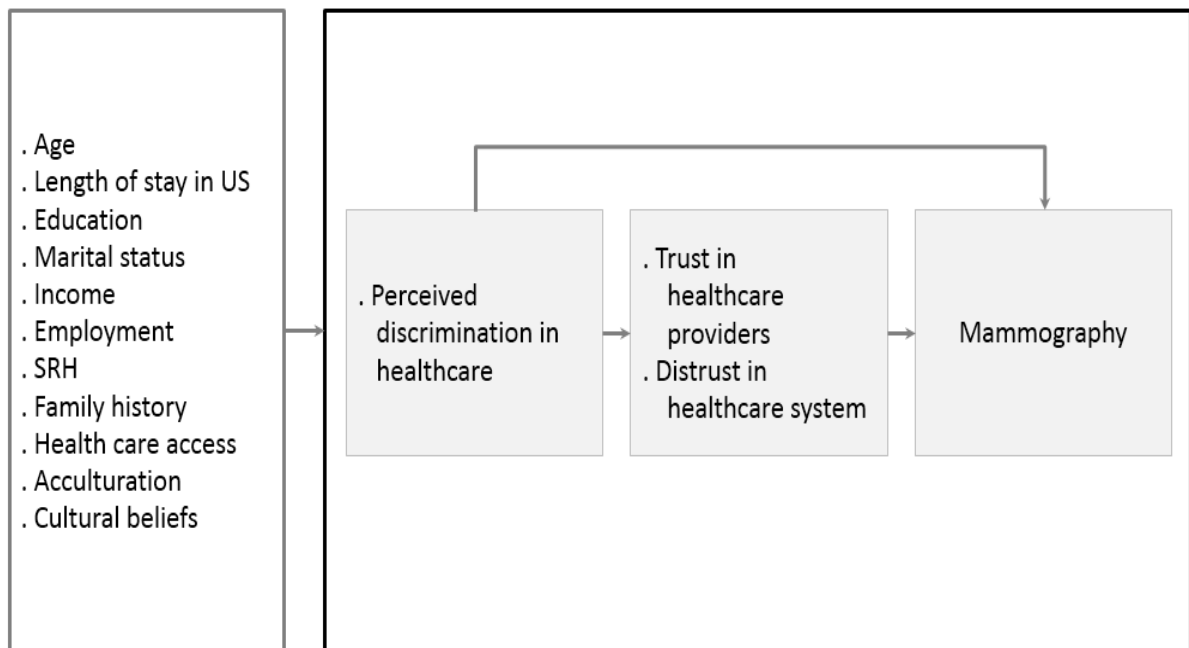


Figure 1. Conceptual framework for this study. *Abbreviation:* SRH, self-reported health.

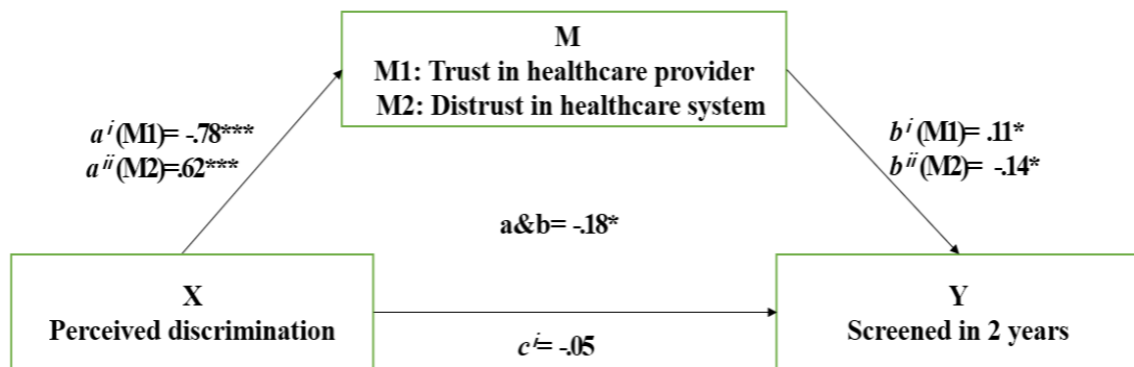


Figure 2. The mediating effect of trust in healthcare providers and distrust in healthcare system between perceived discrimination and screening in the past 2 years. : $*p < .05$, $***p < .001$.

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