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Effects of Acculturation on Mammography Utilization among Korean American Women

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EFFECTS OF ACCULTURATION ON MAMMOGRAPHY UTILIZATION AMONG KOREAN AMERICAN WOMEN

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Abstract

The purpose of this study was to examine the relationship between acculturation and mammography utilization among Korean American (KA) women. The specific aims of this study were to determine the differences in demographic characteristics, perceived health beliefs, self-efficacy, and knowledge of breast cancer, and mammogram history among the four cultural groups (*American identity, Bicultural, Korean identity, and Marginality*) of KA women, and to examine the effects of the level of acculturation on the likelihood of getting a mammogram. Breast cancer remains the most commonly diagnosed cancer among KA women. However, KA women consistently have lower screening rates for breast cancer. Although the overall rate of mammogram utilization by KA women in the United States is low, it is relatively higher when compared with that of women in Korea. This comparatively higher screening rate in KA women may be an indication of sociocultural influences from the host country. A descriptive correlational study using a cross sectional design was conducted. A convenience of sample of 215 KA women was recruited from local Korean churches in LA County. The participants completed several self-administered questionnaires and they were divided into four cultural groups according to their scores on the acculturation scale. The perceived barriers played as the most significant factor for receiving a mammogram. The *American identity* group scored the highest in the self-efficacy scale while the *Marginality* group scored the lowest. No relationship was identified between knowledge and mammography utilization. The *American identity* group had the highest rate (57.1%) of recent mammograms while the *Marginality* group had the lowest rate (26.1%). The *Bicultural* group had the highest rate (21.7%) of regular mammograms while the *Korean identity*

and *Marginality* groups demonstrated lower rates. Logistic Regressions demonstrated that the *Bicultural* group would be significantly more likely to receive regular mammograms than the *Korean identity* group (OR = 0.340). Therefore, acculturation was an important predictor for mammography utilization among KA women in this study. Developing culturally appropriate interventions with specific emphasis on targeting different acculturation levels would be an important factor for increasing breast cancer screening practices of KA women.

Keywords: acculturation, mammography, Korean American women

Dedication

I would like to dedicate this dissertation to the special people in my life who stood next to me and provided me with support, encouragement, and prayers.

To my wonderful daughter, Nicole Kim, who spent a tremendous amount time reading my first draft. She was my editor and the biggest supporter that I could always rely on. To my great son, Sean Kim, who patiently waited for me to complete my work. I know I was not as available as I should have been for you, but thank you for hanging in there and being responsible for your part. Without love, patience, and sacrifice from both of you, I could not have reached my dream.

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CHAPTER I

INTRODUCTION

Statement of the Problem

Breast cancer remains the most commonly diagnosed cancer (American Cancer Society, 2012; Kim, Menon, Wang, & Szalacha, 2010; Lee, Kim, & Han, 2009) and the second leading cause of cancer deaths among women in America (American Cancer Society, 2012; Kim, et al., 2010). According to the most recent SEER (Surveillance, Epidemiology, and End Results) research data, it was estimated that 232,340 women would be diagnosed with breast cancer and 39,620 women would die of breast cancer in 2013. This number translates to 1 in 8 women being diagnosed with breast cancer during their lifetime (SEER, 2013).

Korean American (KA) women are not excluded from this threat of breast cancer and it is the most frequently occurring cancer among KA women as well. It was reported that the incidence of breast cancer among KA women has increased dramatically in the last two decades in the United States and this trend is projected to continue (Deapen, Liu, Perkins, Bernstein, & Rossi, 2002). Despite this rapidly increasing incidence rate of

breast cancer, KA women report disproportionately lower utilization of screening mammography when compared with other ethnic groups (Han, Lee, Kim, & Kim, 2009). Furthermore, KA women suffer from late-stage breast cancer at diagnosis due to their delayed breast cancer screening in the United States (Peek & Han, 2004).

Background and Significance

Korean Immigrants

Korean immigrants are one of the fastest growing Asian populations, and they represent the seventh largest immigrant group in the United States (Suh, 2008). In 1903, the first group of Koreans came to the island of Hawaii to work as immigrant laborers on sugar plantations. Before 1924, the majority of Korean immigrants were young, uneducated, and unskilled men. After the Korean War, a substantial number of war brides and orphans immigrated to the United States. The number of Korean immigrants has grown greatly since the 1965 immigration reform (Kim, 2008). Currently, there are about 1.7 million Koreans in the U.S., and they constitute 0.5 % of the U.S. population (U.S. Department of Commerce, 2010).

Despite the growing number of Korean Americans, they are still considered an underserved population in regards to health services, research, and policies in the United States. Underserved populations, which include racial and ethnic minorities, typically receive less than their fair share of services in society. It was found that underserved populations are more likely to be diagnosed with preventable cancers, to be diagnosed at later stages for cancers due to the delay of the early screening, to receive no treatment or substandard treatment, and to die from potentially curable cancers (Wells & Roetcheim, 2007).

Korean Americans indeed experience disproportionately poorer health outcomes and difficulties while acquiring proper health services under the current health care system in the U.S. (Jo, Maxwell, Yang, & Bastani, 2010). Korean Americans also have the lowest proportion of individuals covered by health insurance and the highest proportion with no usual source of health care among all Asian minorities in the United States. It was found that 40 % of Korean Americans were uninsured for at least part of the year, 26% had not seen a doctor within the past year, and 28% had no usual source of care whereas only 7% of Japanese Americans were uninsured (McCracken et al., 2007).

KA women and Breast Cancer

Not only do Korean Americans suffer from health disparities, but they also suffer from increased health risks from living in the United States. There are not many ethnic-specific population estimates available. Asian populations are usually combined for calculation of incidence rates due to a relatively small number of cases. According to one study report in 2002, the breast cancer rate among KA women was dramatically increased in the last two decades. It was almost doubled from 1988 (26.1 per 100,000) to 1997 (44.5 per 100,000) compared to a 1 -2% increase in the rates for non-Hispanic white and Hispanic women in the Los Angeles County (Deapen et al., 2002).

The fact that the incidence of breast cancer increases among Asian women when they immigrate to the United States is well-documented (Ziegler et al., 1993). Asian immigrant women living in the U.S. for as little as a decade had an 80 percent higher risk of breast cancer than new immigrants (Wu, Guthrie, & Bancroft, 2005). KA women have also been shown to have a higher breast cancer rate than women in Korea (Kim et al., 2010). The incidence rate of breast cancer in KA women living in California was almost

1.5 times higher than that of women living in Korea (Choi, Lee, Park, Kwak, Spring, & Juon, 2010). The higher breast cancer rates are believed to be related to the length of time Korean women have resided in the United States as they adapt to the Western lifestyle and its environment (Lee, Tripp-Reimer, Miller, Sadler, & Lee, 2007). It was also found that KA women were engaged in less desirable health behaviors such as lighter physical activity, higher fat intake, and higher smoking rates since their immigration to the United States (Lee, Sobal, & Frongillo, 2000). These behaviors were shown to have a clear link to risk factors for developing breast cancer (Lee, Park, & Park, 2008).

KA women and Mammogram

There are no proven effective strategies to prevent breast cancer; therefore, early detection is essential for higher survival and cure rates. Mammography was especially documented as an effective method in detecting early cancer in asymptomatic women (Lee et al., 2009; Kim & Menon, 2009). Recently, there has been a controversial debate regarding recommendations for mammography screening between the U.S. Preventive Services Task Force (USPSTF) and American Cancer Society (ACS). Although USPSTF recommends biennial screening mammography for women aged 50 to 74 years, this study will follow more conservative recommendations from ACS for early breast cancer detection. ACS recommends that women age 40 and older should have a screening mammogram every year and should continue to do so for as long as they are in good health (ACS, 2012).

Although the overall use of screening mammography increased over the past decade in the United States, disparity in mammography utilization still persists among ethnic minorities and medically underserved populations (Peek & Han, 2004; Wells &

Roetcheim, 2007). Immigrant populations are often at health risk due to difficulties in accommodating new cultures and new environments. In addition, uninsured immigrant women who have no usual care have the lowest rates of reported mammography utilization (Peek & Han, 2004; Wells & Roetcheim, 2007). Promoting breast cancer screening uptake among these ethnic minority women is one of the important health care issues in the United States. Further, establishing health equity is a major goal of the US national health agenda and one of the key objectives of *Healthy People 2020* (USPSTF, 2012). Therefore, it is crucial to take prevention approaches to target the needs of specific cultural groups rather than taking general approaches to improve the overall health care delivery system. Policies should aim at increasing funding for prevention, screening, and access to health care of ethnic minorities to truly minimize health disparities (Wells & Roetcheim, 2007).

Indeed, KA women are consistently reported to have lower screening rates for breast cancer (Lee et al., 2007; Serna, Tae, Kim, Brecht, & Maxwell, 2001). An alarming finding of mammogram utilization by older KA women reported that almost one-half of the sample (45% of the older Korean women) had never had a mammogram. Of those who had a mammogram, only 24% had one in the last year (Sohn, 2004). When compared to other Asian American subgroups, KA women had the lowest mammography rate. It was reported that Japanese American women were the most frequently screened (78%) whereas only half (53%) of the KA women had been screened for breast cancer according to the 2001 California Health Interview Survey (Kagawa-Singer et al., 2007). In addition, KA women with breast cancer tended to have a larger tumor size (> 1cm) and

a more advanced-stage of cancer (89%) than Caucasian women (70%) at the time of diagnosis (Kumsuk, Flick, & Schneider, 2012).

Although the overall rate of mammogram utilization by KA women in the United States is low, it is relatively higher when compared with that of women in Korea. Women in Korea had lower mammogram screening rates (39.5%) in the past 2 years than KA women (57.2%). The authors concluded that this relatively higher screening rate in KA women might be an indication of sociocultural influence from the host country (Choi et al., 2010). This study finding signified the importance of examining acculturation as a potential predictor for mammography utilization in this population.

Predictors for Mammography Utilization

Many studies have identified the predictors and barriers regarding KA women's breast cancer screening practices. Major predictors include knowledge e of mammogram guidelines (Han, Williams, & Harrison, 2000; Juon, Kim, Shankar, & Han, 2004; Yu, Hong, & Seetoo, 2003), higher education, physician recommendation, health insurance (Yu et al., 2003), and fluency of English (Juon et al., 2004; Yu et al., 2003). Barriers include low perceived susceptibility of breast cancer (Eun, Lee, Kim, & Fogg, 2009; Im, Park, Lee, & Yun, 2004; Juon et al., 2004), lack of time and access, high cost, fear of being diagnosed with breast cancer, and language barriers (Han et al., 2000; Juon et al., 2004; Sadler, Ryujin, Ko, & Nguyen, 2001). These socioeconomic and psychological factors may influence breast cancer screening, but the effects of acculturation on the screening behaviors of KA women are not clearly known.

Acculturation

Acculturation can influence changes in beliefs, values, and attitudes regarding screening behaviors of immigrant women (Brown, Consedine, & Magai, 2006). The traditional Korean women's attitudes towards breast cancer screening are mostly based on their patriarchal culture, fatalism, and taboo of discussion about women's body experiences (Im et al., 2004). However, these traditional attitudes might have changed over time as KA women became accustomed to an American lifestyle. Therefore, studying the relationship between acculturation and health screening behaviors among immigrants is important to understand their health practices. In addition, acculturation as a predictor for mammography utilization is of great interest in this study. Previous studies have minimally described this area of interest; furthermore, no study has examined the relationship between the level of acculturation and mammography utilization in KA women specifically.

The bidimensional acculturation model developed by Berry (1997) was utilized to establish the levels of acculturation in this study. According to this theory, immigrants can develop four different acculturation strategies based on cultural maintenance of the original culture and desirability of contact with the new culture. These strategies are *integration, assimilation, separation,* and *marginalization.* The four cultural groups (*American identity, Bicultural, Korean identity, and Marginality*) in this study are based on these four different strategies of acculturation. *American identity* refers to *assimilation*, *Bicultural* refers to *integration*, *Korean identity* refers to *separation*, and *Marginality* refers to *marginalization.*

Purpose of the Study

The purpose of this study was to examine the relationship between the level of acculturation and mammography utilization among KA women.

Specific Aims

The specific aims of this study were to:

1. Describe the differences in demographic characteristics and mammography utilization status among the four cultural groups (*American identity, Bicultural, Korean identity, and Marginality*) of KA women.
2. Determine if there were significant differences in perceived health beliefs and self-efficacy among the four cultural groups.
3. Determine if there were significant differences in knowledge of breast cancer screening among the four cultural groups.
4. Examine the effects of the level of acculturation on the likelihood of getting a mammography screening.

Theoretical Framework

The Health Belief Model (Rosenstock, 1974) was selected as the theoretical framework for this study to model the proposed relationship between study variables and breast cancer screening practices of KA women at a different acculturative level. The Health Belief Model (HBM) is the one of the most widely used frameworks in preventive health behavior research, especially regarding women's health concerns (Glanz, Rimer, & Viswanath, 2008).

The HBM was developed in the field of public health with increasing interest in primary prevention in the 1950s (Tanner-Smith & Brown, 2010). Although this model evolved in response to public health concerns, it is based on psychosocial theory (Glanz

et al., 2008). Therefore, the HBM has been utilized to explain health behaviors of individuals and to understand the potential reasons for these individuals' underutilization of screening tests for early detection of asymptomatic diseases (Sadler et al., 2001; Stein, Fox, Murat, & Morisky, 1992). According to this model, health behavior mainly depends on an individual's value of a specific goal and the individual's determination of the likelihood of achieving that goal (Janz & Becker, 1984). The HBM contains several primary concepts including *perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cue to action. Perceived susceptibility* refers to one's own perceived risk of acquiring a health condition. To elaborate, a woman must believe that there is a possibility of getting breast cancer before she will be interested in obtaining a mammogram. *Perceived severity* refers to feelings concerning the seriousness of acquiring a condition with medical consequences (death, disability, or chronic pain) and social consequences (effects on work, family life, or relations). Therefore, the combination of susceptibility and severity has been considered a *perceived threat. Perceived benefits* refer to an individuals' perception of health behaviors as feasible and efficacious for a particular condition. *Perceived barriers* refer to the potential negative components of a certain health action and may act as obstacles to undertaking recommended behaviors (Janz & Becker, 1984).

It was suggested that decisions to take action could be stimulated by other factors, particularly by *cues*. Examples of *cues to action* include a post-card reminder, mass media campaign, or interpersonal communication. *Cues to action* are one component of the HBM; however, they are often missing from research studies and little is known about their contribution to health behaviors. *Cues to action* can greatly influence behavior

when perceived threat and benefits are high while perceived barriers are low (Janz & Becker, 1984; Rosenstock, 1966; Rosenstock, 1974).

According to the HBM, KA women are more likely to receive a mammogram if they feel susceptible to breast cancer, think that breast cancer is a severe disease, and perceive the benefits of getting a mammogram while perceiving relatively few barriers.

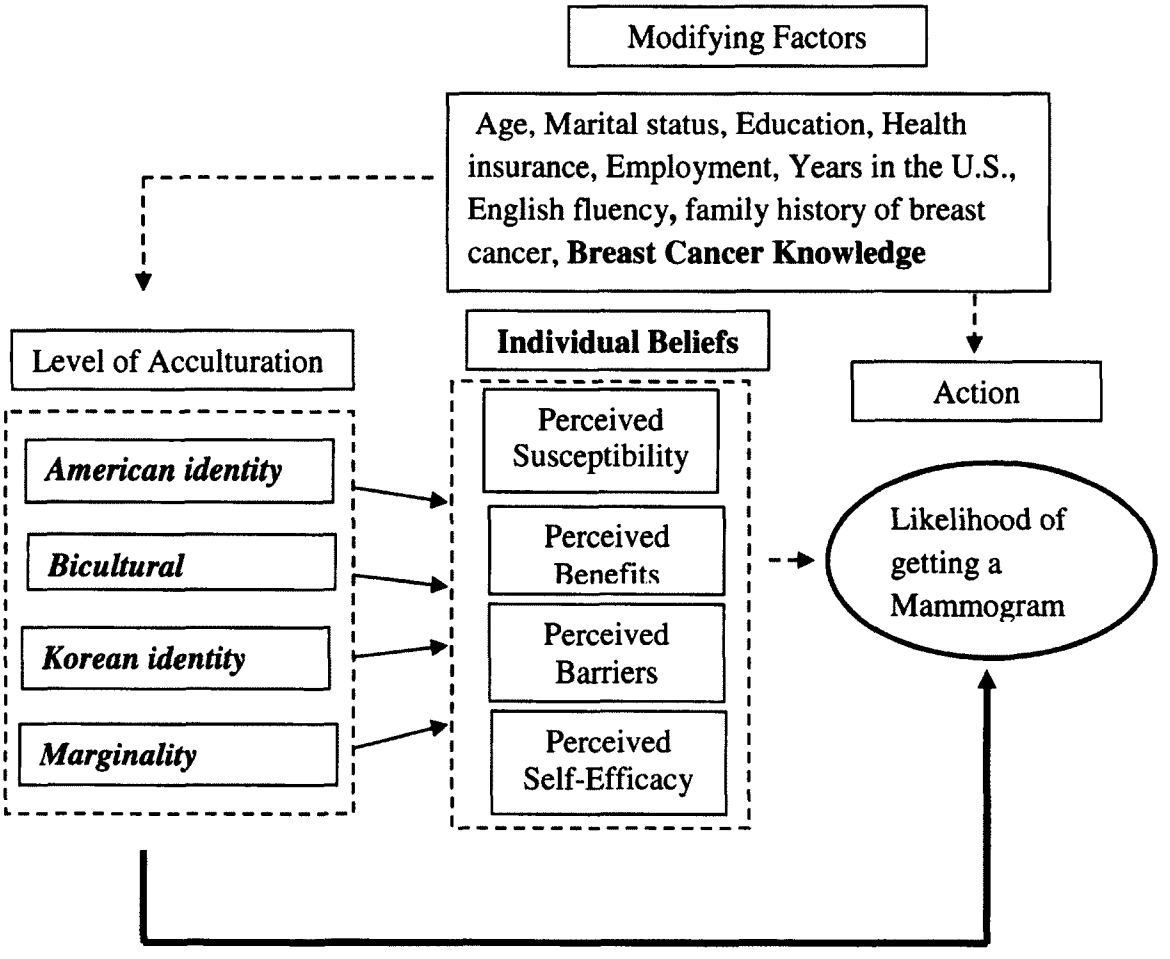

Figure 1. Conceptual Framework

Summary

KA women suffer from breast cancer as the most commonly occurring cancer; however, KA women are consistently reported to have lower screening rates for breast cancer. Although the overall rate of mammogram utilization by KA women in the United

States is low, it is relatively higher when compared with that of women in Korea. This comparatively higher screening rate in KA women may be an indication of sociocultural influences from the host country. Therefore, it is important to examine acculturation as a predictor for mammography utilization in this population because acculturation can influence changes in the beliefs, values, and attitudes regarding screening behaviors of immigrant women.

Acknowledging acculturation and its effects on the health of immigrants provides an opportunity for the nurses to become more culturally sensitive and able to offer culturally-sensitive education to this vulnerable population that suffers from cancer health disparities under the current health care system in the U.S. (Jo et al., 2010). This is also in line with meeting one of the goals of *Healthy People 2020* which is to eliminate health disparities among specific population segments.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter presents the review of literature and it is organized in six sections: 1) breast cancer and mammography, 2) demographic variables, 3) acculturation, 4) health beliefs, 5) self-efficacy, and 6) breast cancer knowledge. The operational definitions are then presented.

Breast cancer and Mammography

Breast cancer is one of the most significant health problems and remains the most common cancer and the second leading cause of cancer deaths among women in the United States (American Cancer Society, 2012). There are an estimated 2,829,041 women currently living with breast cancer in the United States (SEER, 2013).

Significant racial and ethnic disparities in breast cancer incidence, mortality rates, and survival rates have been reported in the United States (Wells & Roetzheim, 2007). The highest breast cancer incidence rate was found among white women whereas Asian women were more likely to be diagnosed with breast cancer at a later stage which leads to a higher mortality rate. The 10-year survival rate of KA women from breast cancer was

only 54% (Choe, Cha, Joh, Song, Noh, & Kim, 1991) whereas the survival rate among white women older than 60 years was 88% (Matheson & Tretli, 1996).

Generally, Asian women who had a traditional diet high in soy products had relatively low incidence (Im, 2000). However, it was found that the breast cancer incidence rate increases as Asian women adapt to a Western life style which includes higher fat consumption (Lee et al., 2000).

Three methods of breast cancer screening have been widely utilized. These methods include breast self-examination, clinical breast examination by a trained health professional, and screening mammography (Wells & Roetzheim, 2007). Screening mammography has been promoted as the most effective method in detecting early cancer in asymptomatic women (Kim & Menon, 2009; Lee et al., 2009). However, Asian women were found to be less likely to participate in screening mammography. KA women's screening mammography utilization rates remain suboptimal (Kagawa-Singer et al., 2007). It was reported that less than 59% of KA women had mammograms within the past 2 years; only 30-39% of KA women had a mammogram in the past year; and about 65–81% of women had at least one mammogram sometime in the past (Kim & Menon, 2009; Lee, Fogg, & Sadler, 2006; Sarna et al., 2001). These finding are far below *Healthy People 2020*'s specific goal of breast cancer screening, that 70% of all women ≥ 40 years old should have had a mammogram within the preceding 2 years (USPSTF, 2012).

Demographic Variables

A variety of sociodemographic variables have been associated with mammogram utilization among KA women. Studies have shown statistically significant differences in mammogram utilization in relation to age; however, the research is contradictory. For

example, one study found that older KA women were less likely to participate in breast cancer screening. Approximately 32% of older KA women (aged > 65) reported that they never had a mammogram as compare to only 19% of younger women (aged 40-64) have never had a mammogram (Eun et al., 2009). Further, less than 10 % of women older than age 65 had either recent or regular mammograms whereas over 50% of younger than 65 (age 50-64) women had either recent or regular mammograms (Juon et al., 2004). In contrast, women who had had a mammogram were significantly older than those who had never had one according to Lee et al. (2009). The average age of women who had a mammogram in the past was 58.5 whereas the average age of women who never had a mammogram was 50.9 (Lee et al., 2009). A similar finding was also presented in a study that stated that KA women older than 50 years have received a higher percentage (79%) of having a screening mammogram than women younger than 50 years old (50%) in the past 2 years (Yu et al., 2003). This finding was in line with another study done on women in Korea. Age was statistically associated with receiving mammograms and showed a positive correlation with mammogram status among 310 Korean women (Ham, 2006).

Other factors that were statistically significant related to mammogram screening were access to health care (i.e., routine checkups, insurance) and government support among elderly KA women (Juon, Seo, & Kim, 2002). Regular check-ups and encouragement from a physician or family member were highly associated with mammogram utilization (Han et al, 2000; Ma, Gao, Lee, Wang, Tan, & Shive, 2012). Interestingly, in a study by Juon et al. (2004), recommendations by Korean physicians were not significantly associated with screening mammography utilization among KA

women. Instead, having a non-Korean doctor was associated with an increased likelihood of getting a mammogram (Lew et al., 2003). Routine physical examination was the strongest independent correlate of mammography utilization for KA women aged 50 and older in two California counties (Wismer et al., 1998). This result was supported by another study that reported that women who had had a health check-up were more likely to have had a screening mammogram (Choi et al., 2010).

It was found that marital and employment statuses were important, but these were not statistically significant (Wismer et al., 1998). On the other hand, marital status and insurance status strongly predicted the use of health services including mammography utilization in another studies (Juon et al, 2004; Sohn & Harada, 2004). It was reported that employed KA women with insurance coverage had higher rates of mammography than employed women without insurance (Juon et al., 2004). This finding was supported by another study that stated that KA women who had health insurance demonstrated higher use of screening mammograms. Among participants who had health insurance, 70% of them received a mammogram in the past 2 years while only 17 % of KA women received a mammogram among uninsured participants (Yu et al., 2003). It was also found that married KA women were 2.9 times more likely to have a screening mammogram among 339 KA women in California (Lew et al., 2003).

Researchers have also found that KA women with less education were less likely to report screening behaviors (Juon et al. 2002). However, in another study, it was reported that KA women who were not educated in the United States were more likely than others to receive preventive care (Lee at al., 2012). Perceived health status has also been reported to affect screening behavior. Women who considered themselves to be in

poor health were less likely to have a mammogram than women who considered themselves to be in excellent health (Blustein & Weiss, 1998; Lee at al., 2012). Similar findings were presented in another study that stated that KA women who have chronic medical condition were less likely to receive regular mammograms (Juon et al., 2004). Since acculturation can affect many of the sociodemographic factors related to health behaviors, it is essential to compare these factors among KA women in different acculturative stages.

Acculturation

Acculturation has gained a great deal of interest and has been widely utilized in nursing research related to different cultural groups or immigrant populations in recent years. There has been a tremendous growth of literature that addresses the relationship between acculturation and the health of immigrant populations (Lee et al., 2000). However, acculturation is a complex concept which engenders much confusion and debate in regards to its definition because it involves multi-level and multidimensional processes including psychological and socio-structural domains on both an individual and a group level (Navas, Garcia, Sanchez, Rojas, Pumares, & Fernandez, 2005).

The definition of acculturation has been modified several times since the term first appeared in literature in 1920 (Berry, 1997). It originated in anthropology, and the concept was adopted by many other disciplines including sociology, epidemiology, and psychology. The definition of acculturation was evolved by each discipline based on its understanding and use. Initially, anthropological perspective described acculturation as a process of interactivity between cultures (Salant, & Lauderdale, 2003). The classic definition of acculturation was defined by anthropologists as "those phenomena which

result when groups of individuals having different cultures come into continuous first-hand contact with subsequent changes in the original culture patterns of either or both groups" (Redfield, Linton, & Herskovits, 1936). A sociologist, Milton Gordon (1964) developed a theory of assimilation which focuses on the unidimensional approach to acculturation. Gordon viewed assimilation as a linear cultural change. Assimilation has a distinct meaning as compared to acculturation in that it is based on a "zero-sum trade-off model". It was referred to as "Anglo-conformity" which expects the immigrants' complete abandonment of their own ethnic cultures while adopting the cultures, values, and beliefs of the host society (Gordon, 1964).

In contrast to this sociological view, psychological acculturation researches have focused on the individual-level change within acculturation based on the bidimensional model. John Berry (1997) developed an acculturation framework outlining two separate processes and theorized that individuals and groups in a multicultural society hold acculturation attitudes based on their orientation to two central issues: "cultural maintenance of the original culture and desirability of intergroup contact with the new culture." These two processes include four acculturation strategies that describe differences in individual attitudes and behaviors. These strategies are *integration, assimilation, separation* and *marginalization. Integration* represents people who have maintained many beliefs and behaviors from their original culture, but who have also adopted behaviors and attitudes from the new culture. *Assimilation* refers to those who have entirely adopted the attitudes and behaviors of the new culture. *Separation* occurs when a person refuses the new culture and turns entirely to their culture of origin.

Marginalization occurs when a person does not identify with either the culture of origin or the new culture (Berry, 1997).

Immigrants are most likely to belong to these four different domains as a result of acculturation. Korean immigrants exhibited similar acculturation patterns as described by the bidimensional model (Choi et al., 2009; Hurh & Kim, 1984; Lee et al., 2000). In accordance with the bidimensional model of Berry (1997), an alternative strategy of Korean immigrant acculturation was well described in the study done by Hurh and Kim (1984). The authors concluded that the typical mode of Korean immigrants' adaptation in the United States was far from such a "zero-sum model" of assimilation; rather, it was "additive or adhesive" which means certain aspects of American culture and social relations were added on to Korean immigrants' traditional culture and social networks.

Adapting to a new way of life affects immigrants in many dimensions. The changes that occur can influence immigrants' thought processes, beliefs, values of life, and more importantly health behaviors (Lee et al., 2000). The relationship between acculturation and health behaviors is an intricate one and may differ between immigrant groups (Navas et al., 2005; Page, 2006).

The process of acculturation has indeed brought many different challenges and life modifications to Korean immigrants that could potentially result in benefits or adverse effects to the health of these immigrants. Consequences of acculturation are conflicting because acculturation has positive effects on certain aspects of health, no relationship with others, and negative effects on other aspects of health in Korean immigrants (Abraido-Lanza, Ambrister, Florez, & Aguirre, 2006). For example, it was

found that a higher level of acculturation was related to less acculturative stress, which, in turn, was associated with less depression (Oh, Koeske, & Sales, 2002). On the contrary, Korean immigrants who reported abandonment of Korean identity, tradition, and values scored higher for depression (Choi, Miller, & Wilber, 2009).

Several studies have indicated that acculturation is strongly related to an immigrant's utilization of health care resources and information that ultimately increase the overall quality of life (Lee et al., 2007; Lim et al., 2008; Shin & Shin, 1999). These findings suggested that more acculturated individuals feel less stress from the demands of adjustment and exhibit a better health status. Acculturation is also related to higher income, advanced education, and higher socioeconomic status as well as self-confidence and comfort in the host society (Rudmin, 2009). On the other hand, lack of familiarity with the health care system, language barriers, inadequate health insurance coverage, and lack of social support were significant factors associated with poor health care outcomes of Korean immigrants (Lim et al., 2008). This wide range of potential impacts of acculturation on the health of immigrants is not simple to explain (Navas et al., 2005).

Despite the critical role of acculturation in understanding health behaviors of immigrant minorities, its instrumentation has not been well-established. Many researchers raised concerns regarding the current acculturation measurements as being inconsistent and insufficient (Hunt, Schneider, & Comer, 2004; Jang, Kim, Chiriboga, & King-Kallimanis, 2007; Rudmin, 2003; Salant, & Lauderdale, 2003). The instrument that measures acculturation needs to be sensitive to various ethnic groups because many different factors interplay within each culture. It also needs to be sensitive to change in

order to examine the changes in acculturation over time (Stewart, & Napoles-Springer, 2003).

In the beginning of acculturation measurement, a linear, unidirectional acculturation scale was widely utilized. In the case of Asian acculturation to North America, the most widely used instrument is the Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA; Suinn, Ahuna, & Khoo, 1992). This instrument was also the most frequently used in nursing research to measure acculturation. Despite its popularity in many disciplines, this scale became a focus of debate and criticism because of its lack of wide-range for the components of acculturation. Since then, the trend has shifted to the bidimensional model (Berry, 1992; Hunt et al., 2004). This approach allows individuals to report varying degrees of acceptance and adherence to their original and to the host cultures.

There is no acculturation instrument developed specifically for Korean Americans at present. Therefore, acculturation has been measured most commonly by proxy variables in the majority of current studies. The most frequently used indicator was language proficiency (Arcia, Skinner, Bailey, & Correa, 2001). Others include the length of residence, generation status, proportion of the participant's life lived in the United States, and age at the time of immigration. However, these are considered indirect measures of the acculturation process rather than measures of cultural changes in values, attitudes, and beliefs (Zambrana & Carter-Pokras, 2010). More importantly, psychological and emotional contexts of acculturation faced by KA women have been typically ignored in these measurements.

Therefore, measuring acculturation simply by proxy variables resulted in inconsistent data and may explain why many previous intervention studies have failed to demonstrate a relationship between acculturation and health promotion behaviors among Korean immigrants (Kim & Menon, 2009; Kim et al., 2010; Moskowitz, Kazinets, Wong, & Tager, 2007; Suh, 2008). Consequently, empirical studies on the relationship between acculturation (using proxy measures) and mammography utilization among KA women have demonstrated conflicting results. Although some studies have reported positive relationships, others have demonstrated the opposite.

According to one study by Yu et al. (2003), mammography utilization by KA women subgroup ($n = 63$) was positively related to their years in the United States. In this study, about 76% of women who had lived longer than 10 years in the U.S. received a mammogram as compared to the 29% of women who received a mammogram after having lived in the U.S. less than 10 years. Han et al. (2000) also concluded that a convenience sample of 107 KA women who had resided longer in the United States were more likely to be screened for breast cancer. Similar findings were presented in another study where the percent of lifetime spent in the United States was used as a proxy for acculturation. In this study, the percent of lifetime spent in the United States was considered as an independent factor with adherence to cancer screening among 229 KA women (Maxwell, Bastani, & Warda, 2000). It was suggested that women who have spent more of their lifetime in the United States may have higher English proficiency and better skills in negotiating the medical system than more recent immigrants; therefore, they may have had more opportunities for screening. However, it is important to keep in mind that those KA women who spent a higher percentage of their lifetime in the United

States might have been influenced by cultural factors from the host society in regards to their cancer screening practices. Therefore, the authors strongly recommended future studies on the role of acculturation in KA women's breast cancer screening behaviors.

Contrary to these study findings, neither the proportion of lifetime in the U.S. nor language skills predicted knowledge or use of preventive services among the 656 KA women in the Los Angeles County in a particular study (Sohn & Harada, 2004). It was concluded that a possible reason for this finding was that selected acculturation variables (the proportion of lifetime in the U.S. and language skills) in the study did not accurately represent the concept of acculturation.

In general, it was believed that KA women who were unable to speak or read English faced many obstacles in accessing screening services, communicating or interacting with health care providers, and even getting free or low-cost community cancer screening programs (Juon et al., 2004; Sadler et al., 2001). However, the ability to speak English was not a significant variable that affected KA women's breast cancer screening behaviors among the study participants in a study (Yu et al., 2003). The authors concluded that the women's ability to speak English was significantly associated with mammography utilization in Asian American women (both Chinese and Korean American women). In fact, there were no significant differences in mammography utilization between women (63%) who could speak only Korean and women (66%) who could speak both Korean and English. Proficiency in the English language was not related to KA women's screening behaviors in the study because 65% of the participants were seen by a Korean physician.

Similarly, acculturation variables including birthplace, the proportion of life spent in the United States, and English fluency did not support the hypothesis that more acculturated Korean Americans would have higher utilization rates of health care services. The sample of Korean Americans in this particular study was also recruited from a large Korean community in Los Angeles and these Korean Americans were easily able to overcome the potential barriers to health care services (Shin, Song, Kim, & Probst, 2005).

Although English fluency is considered a component of acculturation, it is considered more of a proxy for health care access because of its strong association with screening services independent of cultural attitudes and values (Shin et al., 2005). Therefore, measuring acculturation with English fluency may not demonstrate the relationship between acculturation and breast cancer screening behaviors in this population. In addition to these inconsistent findings, several intervention studies have failed to demonstrate a significant effectiveness on improving breast cancer practices of KA women.

In a study by Kim and Menon (2009), the *stages of readiness* for mammography use among 300 KA women aged 40 years or older with no breast cancer diagnosis were assessed before and after a 45 minute interactive breast cancer early screening education (*GO EARLY*). Acculturation was also measured using the Suinn-Lew Asian Self-Identity Acculturation (SL-ASIA) Scale at pre and post-intervention. The authors concluded that there was a significant increase in the acculturation mean-scores in the 6 weeks after intervention. However, this finding is less reliable because acculturation takes place as a result of constant interaction with other cultures (Redfield et al., 1936) which may not typically occur in a 6 week-period. Overall, KA women in this study did not show the

upward movement on the *stages of readiness* for mammography after the *GO EARLY* educational intervention.

Another study was done to examine the impact of a culturally appropriate educational program (*GO EARLY Save Your Life*) on knowledge, beliefs (breast cancer and traditional Korean cultural beliefs), and mammography utilization among 180 KA women aged 40 years or older who had not had mammograms within the past 12 months. Although the education was effective in increasing breast cancer screening related knowledge and beliefs (barriers, fear, seriousness, fatalism, and preventive health orientation), there were no statistically significant differences in mammography use between the intervention and control groups (34 % vs. 23%) at 24 weeks post-test. In addition, the rates of mammography use for both groups were increased at 24 weeks post baseline. The authors have reported that there was no significant difference in acculturation levels between the intervention and control groups at the baseline. However, acculturation was again measured by a unidimensional acculturation scale (SL-ASIA scale) and the results may not have represented the true differences in acculturation levels. Although the intervention was a culturally relevant education program (Kim et al., 2010), it might not have met the unique needs of KA women in the different levels of acculturation.

In contrast, a 120 minute in-class education followed by a trained lay health worker (LHW) counseling intervention increased the rates of breast cancer screening behaviors (BSE, CBE, and mammogram) significantly at 6 months ($P < 0.001$) among a relatively small number of participants (N=93). However, there were no significant differences in breast cancer knowledge and beliefs among these KA women (Han et al.,

2009). The findings are interesting, yet less plausible, because behavior changes (obtaining a mammogram) would usually occur as a result of changes in knowledge and beliefs regarding breast cancer screening.

Another large multifaceted community intervention including educational workshops, mammography facility negotiations, and a media campaign was conducted to improve breast and cervical cancer screening (BCC) among KA women in two counties (Alameda County, CA and Santa Clare County, CA) for 48 months. Random samples of KA women from each county were surveyed by telephone in 1994 (n = 818) and 2002 (n = 1084). However, none of intervention comparison group differences were significant over time; instead, mammogram screening rates had increased in both intervention and control groups (Moskowitz et al., 2007). Although this program was conducted for 48 months, only 53% of the KA women in the intervention county reported awareness of this intervention program, and only 10% of the participants reported that they participated in the women's health workshop which was the most intensive component of this program. The findings of this particular study raised concerns regarding large-scale community intervention which the effects of intervention are often difficult to measure. Instead, church-based small intervention could be more effective in promoting breast cancer screening among KA women (Moskowitz et al., 2007).

Kim and Sarna (2004) implemented a three-group design study to evaluate a culturally appropriate peer-group education ("*Let's Talk Between Women*") for KA women. The baseline tests were administered to all participants (N=141) to assess their knowledge and attitudes regarding breast cancer screening. The intervention group participated in the peer-group education and a post-test was administered to this group

whereas the mammography-only group was not included in the education. However, the *free or low-cost* mobile mammography services were provided to both intervention and mammography-only groups one week after the baseline test. The control group received neither education nor mammography services. Women in the control group were only given the community resources for mammography services. Mammography utilization at a 2-month follow-up was significantly improved in both groups (87% for the intervention and 72% for the mammography-only group) as compared to the control group (47%). However, there was no statistically significant difference between the intervention and the mammography-only groups. The authors have suggested that access to *free or low-cost* mammograms may be all that was needed to improve mammography utilization in this particular sample of KA women. The effectiveness of the educational program was not warranted.

Another study (N= 186) examined the impact of a breast cancer intervention on KA women's intentions to use mammography. This study developed a Korean-language "photonovel" to promote breast cancer screening. The "photonovel" was distributed in small-group educational presentations and included a Korean-dubbed videotape on how to perform breast self-examinations. At a 6-month follow up, significantly more women in the intervention group had intentions to have mammograms than in the control group. It was reported that women in the intervention had 2.96 times greater posttest intentions to have mammogram than women in the control group (95% CI, 1.13–7.66). However, the finding might have been a result of over-reporting because of KA women's desires to provide socially acceptable responses. Further, these women's intentions have resulted in

behavior changes are unknown because actual mammography screening was not assessed (Juon, Choi, Klassen, & Roter, 2006).

Overall, the intervention studies to promote breast cancer screening beliefs and behaviors of KA women were rather ineffective. This might be due to the complexity and challenges involved with intervention programs that target minority ethnic groups. In addition, measuring acculturation by its proxies could not adequately describe this complex process. Numerous factors of acculturation could influence breast cancer screening beliefs and behaviors of KA women. However, none of these selected studies were able to establish the relationship between acculturation and breast cancer screening behaviors of KA women. Therefore, examining the different levels of acculturation among KA women would be an important step to understanding its impact on breast health behaviors of these women.

Health Beliefs

Several researchers have attempted to predict breast cancer behaviors of KA women by utilizing the Health Belief Model (HBM); however, the findings were inconsistent. Breast cancer-related health beliefs (perceived risk/susceptibility, seriousness, benefits, and barriers) played a significant role in mammography utilization among many other ethnic subpopulations (Kim et al., 2010). Generally, high perception of barriers to having a mammogram as well as low perception of benefits for mammography use and low perception of susceptibility to breast cancer were significantly associated with low rates of mammography utilization, specifically among KA women (Kim et al., 2010).

In a study by Lee et al. (2009), only perceived benefits were significantly associated with mammography utilization whereas perceived susceptibility and perceived barriers were not associated with mammography utilization among 100 KA women. Another study was done to assess the relative influence of the HBM constructs on prior mammography utilization and the intention to obtain a mammogram in the future. It was found that perceived susceptibility was the most powerful predictor for future intention of getting a mammogram whereas the barriers and *cues to action* (communication with physician regarding mammogram, i.e. whether the physician had discussed mammogram with a woman) did not directly influence prior mammography use or future intention among 1,057 women over the age of 35 (Stein et al., 1992).

A telephone survey study was conducted on 187 KA women to identify the relationship between health beliefs and breast cancer screening among older (n =73) and younger (n =114) KA women. The two groups (older and younger KA women) had significantly different health beliefs about breast cancer screening on all four subscales: perceived susceptibility, seriousness, benefits, and barriers (Eun et al., 2009). Overall, older women had a significantly lower level of susceptibility and benefits and a higher level of seriousness and barriers compared to younger women. It was also found that older women who had had a mammogram showed higher levels of perceived seriousness and benefits and lower levels of perceived barriers as compared to women who had never had a mammogram. Therefore, it is likely that different health beliefs, especially higher levels of perceived barriers and lower levels of perceived seriousness and benefits among older women, could contribute to their lower screening rates (Eun et al., 2009).

Perceived barriers were the most important factors in determining mammogram utilization, but perceived susceptibility and seriousness were not significant factors among a convenience sample of 107 KA women. Perceived barriers to having mammography included lack of time, lack of family support, lack of transportation, cost, knowledge deficit, fear, anxiety, and inconvenience in general (Han et al., 2000). Similar conflicting findings were observed among women in Korea. Perceived susceptibility was significantly associated with their past mammography utilization whereas perceived susceptibility and perceived barriers were significant in predicting intention to receive mammography. Therefore, women with higher perceived susceptibility were more likely to have received mammograms in the past, and women with higher perceived susceptibility and lower perceived barriers were more likely to have positive intention for future mammography screening (Ham, 2006). These mixed results may be due to the differences in levels of acculturation among KA women; however, there is no research to date that examines this hypothesis.

Self-efficacy

The concept of self-efficacy is rooted in Bandura's social cognitive theory and it was defined as people's beliefs about their capabilities to produce effects (Bandura, 1986). Further, self-efficacy refers to the confidence that one feels about performing a particular behavior, including the ability to overcome the barriers to achieve that behavior (Bandura, 1986). Self-efficacy has been an important variable in studies of human behaviors across various disciplines, and Janz, Champion, & Strecher (2002) also contended that self-efficacy is an important factor in successfully changing lifelong

behavior. Self-efficacy was considered the required ability to organize and participate in the courses of action to achieve the designated performance (Bandura, 1986).

Further, perceived self-efficacy has received attention from clinical researchers in relation to breast cancer screening behavior. In relation to getting a mammogram, self-efficacy was related to the confidence that a woman has in her ability to find a place where she can make an appointment to get a mammography screening (Champion, Skinner, & Menon, 2005).

A number of studies have shown that self-efficacy was significantly associated with middle-aged women's breast health promotion behaviors and intention to undergo mammography screening (Champion & Skinner, 2003; Egbert & Parrott, 2001). Rural women's perceived self-efficacy was strongly related to performing regular detection practices for breast and cervical cancer among a sample of southeastern U.S. farm women (N = 206) according to a study done by Egbert and Parrott (2001). The importance of self-efficacy in the explanation of intention to get a mammogram was also supported by a study done in the UK among 1215 women who had never had breast screening (Rutter, 2000). It was argued that increasing women's self-efficacy by educating personal skills was important to overcome physical and psychological barriers of their getting a mammogram because increased self-efficacy may enhance these women's motivation to get a mammogram.

Similarly, self-efficacy was the strongest predictor for intention of getting a mammogram among 293 women aged 40-65 years (Tolma, Reininger, Evans, & Ureda, 2006). Further, it was found that most women (54%) did not maintain getting a screening mammogram over 3 years. Women who did not maintain their mammogram adherence

showed lower self-efficacy and were less likely to be confident about getting their next mammograms (Gierisch, Earp, Brewer, & Rimer, 2010).

In a study conducted by Gonzalez (1990), perceived self- efficacy was strongly and positively related to the performance of BSE among Mexican American women. Female Hispanic farmworkers (N= 200) aged 50 years and older in the Lower Rio Grande Valley also reported that self-efficacy for obtaining a mammogram was significantly related to their adherence; therefore, efforts to increase these women's self-efficacy were strongly recommended by the authors (Palmer, Fernandez, Tortolero-Luna, Gonzales, & Mullen, 2005).

Among Korean American (KA) women, self-efficacy was also significantly related to mammography screening (Maxwell, Bastani, & Warda, 1998). A similar finding was presented in another study that stated that self-efficacy was significantly associated with both past mammography utilization and intention to receive future mammograms among 310 women in Korea (Ham, 2006). Further, it was also reported that KA women who have never had a mammogram and are not thinking about having one in the next six months (pre-contemplators) had a significantly lower self-efficacy score (Kim et al., 2009).

Self-efficacy was often measured along with the health belief model (HBM) to improve the model's explanation of health behavior (Janz et al., 2002). For behavior change to succeed, women must feel threatened by breast cancer risks (perceived susceptibility and severity) and believe in the benefits of getting a mammogram, which include early detection and treatment at an acceptable cost. These women also must feel themselves competent to overcome perceived barriers to get a mammogram.

Janz et al. (2002) also argued that long-term behavior change requires a great deal of confidence to be successful. Therefore, to promote lifelong change of behavior such as getting regular mammograms, the reinforcement of self-efficacy in obtaining mammography screening is crucial. Interventions to increase self-efficacy among KA women may include building confidence in their ability to seek out and receive regular mammograms by overcoming any perceived physical or mental obstacles (Ham, 2006). The current study is interested in examining the possible relationship between acculturation and self-efficacy.

Breast Cancer Knowledge

Another important factor of breast cancer screening behaviors of KA women is their knowledge of breast cancer. KA women's lack of knowledge has been consistently reported in literature as a correlate of the low utilization of screening services (Han et al., 2000; Juon et al., 2004; Sadler et al., 2001; Sohn, & Harada, 2004).

There was a significant association ($p < .001$) between mammography utilization and knowledge about breast cancer screening. Among KA women who did not have correct knowledge, only 50 % of them had had a mammogram whereas 74% of KA women with correct knowledge had had a mammogram in the past 2 years (Yu, et al., 2003). Knowledge was also significantly associated with intention to receive mammography among women in Korea. It was reported that Korean women ($N = 310$) who had higher scores on the knowledge questionnaire were more likely to receive a mammogram in the future (Ham, 2006).

A majority of KA women (89.4%) reported having insufficient breast cancer knowledge and these women were interested in receiving more information (Sadler et al.,

2001). Knowledge of mammography guidelines was the strongest independent correlate of having regular mammograms. It was found that women who had knowledge of mammogram guidelines had more than 10 times greater odds of having a regular mammogram (Juon et al., 2004). Approximately 48.4% of KA women reported having no awareness of breast self-examinations (BSE) and 41.7% had never performed a BSE within the last 12 months (Sohn & Harada, 2005). The findings of this previous study indicated the importance of breast health education to increase their knowledge which would, in turn, change their behaviors.

Operational Definitions

Levels of Acculturation

The four levels of acculturation in this study were based on four different strategies of acculturation: *integration, assimilation, separation, and marginalization*, as identified by Berry (1997). *American identity* refers to *assimilation*, *bicultural* refers to *integration*, *Korean identity* refers to *separation*, and *marginality* refers to *marginalization*.

There were four distinctive levels of acculturation in this study sample. The *Korean identity* group was characterized by a strong Korean heritage cultural orientation and a weak American cultural orientation which is similar to Berry's "separation" strategy. The *Marginality* group showed low levels of both Korean and American cultural orientation which is similar to Berry's "marginalization" strategy. Individuals in the *American identity* group had a weak Korean cultural orientation and a strong American cultural orientation and this group was similar to Berry's "assimilation" strategy. Lastly,

the individuals in the *Bicultural* group were to have high level of both Korean and American cultural orientation which was similar to Berry's "integration" strategy.

Health Beliefs

Perceived Susceptibility refers to beliefs about the likelihood of getting breast cancer. It is conceptualized that a Korean woman must believe that there is a possibility of getting a breast cancer before she will consider obtaining a screening mammogram. *Perceived Benefits* refers to perceived positive outcomes of obtaining a mammogram. It is believed that actual behavior change will be influenced by perceived benefits. A Korean woman will not accept mammogram recommendation unless she also perceives that a mammogram has potential benefits of reducing the threat of breast cancer. *Perceived barriers* refer to perceived emotions, physical or structural concerns related to mammography. KA women will weigh the expected benefits with perceived barriers to determine getting a mammogram.

Self-efficacy

Self-efficacy refers to a Korean woman's overall confidence of getting a mammogram while overcoming any possible obstacles.

Recent and Regular Mammograms

Recent mammography use is defined as having had a mammogram within the past year, and regular mammography use is defined as having had an annual mammogram in each of the last five years according to American Cancer Society recommendations.

Summary

Overall, knowledge related to breast cancer screening has been identified as an important factor that can influence KA women to obtain a screening mammogram.

Several studies have shown that self-efficacy was significantly associated with KA women's breast health promotion behaviors and intention to undergo mammography screening. Health beliefs regarding screening mammography among KA women have shown inconclusive findings. It is important to examine how different levels of acculturation have impacted these women's beliefs in regards to their breast cancer screening behaviors. Several studies indicated the lack of sensitivity in measuring acculturation by proxies (English fluency, the length of residency in the U.S., and the age of immigration). These proxy variables have shown very mixed and inconsistent findings related to breast cancer screening practices among KA women. Because of the lack of research that examine the direct relationship between the levels of acculturation and mammography utilization, the current understanding of the role of acculturation and its effects on health behaviors among KA women remains significantly limited. To bridge the gap in literature, this study proposed to examine specifically the levels of acculturation and their effects on breast cancer screening behaviors of KA women and the differences in knowledge, health beliefs, and self-efficacy among these women in the four levels of acculturation. Based on the literature review, it was hypothesized that more acculturated groups would be more likely to receive a mammogram than less acculturated groups.

To the best of my knowledge, this was the first study to examine the levels of acculturation specifically in relation to mammography utilization among KA women by utilizing a bidimensional scale. The findings from this study could work as a cornerstone to develop interventions congruent with the level of acculturation to improve KA women's breast cancer screening behaviors.

CHAPTER III

METHODS

This chapter describes the methodology of this study. The purpose of this study, the specific aims, research design, setting, sample, data collection instruments, data collection procedures, and data analysis are presented in a sequential manner.

Purpose of the Study

The purpose of this study was to examine the relationship between the level of acculturation and mammography utilization among KA women. The specific aims of this study were as follows:

1. Describe demographic characteristics and mammography utilization status among KA women in differing levels of acculturation.
2. Determine if there were significant differences in health beliefs and self-efficacy by acculturation level.
3. Determine if there were significant differences in knowledge of breast cancer screening by acculturation level.
4. Evaluate the effects of level of acculturation on likelihood of mammography screening.

An additional exploratory aim was included to evaluate the potential relationship between the overall demographic characteristics of the participants and mammography utilization.

Research Design

A cross-sectional descriptive correlational design was used to address the study aims. This research design was selected because it is designed to describe the correlation between variables rather than to establish cause-and-effect evidence at this point (Polit & Beck, 2012). This research study was to examine the relationships between the level of acculturation and mammography utilization by KA women at this particular point in time.

Study Variables

The dependent variable of this study was the status of recent and regular screening mammogram. A recent mammography use was defined as having had a mammogram within the past year, and regular mammography use was defined as having had an annual mammogram in each of the last 5 years (Wu & Ronis, 2009).

The independent variables of this study were the levels of acculturation (*American identity, Bicultural, Korean identity,* and *Marginality*), demographic factors (age, marital status, level of education, status of employment, health insurance status), perceived health beliefs, perceived self-efficacy, and breast cancer knowledge.

Setting

This study was conducted between March and April of 2013 in several Korean churches in the Los Angeles County. The majority of the participants were recruited in Korean churches located in *Koreatown*. Korean Americans are found to have a very high church attendance. Over 70% of Korean Americans attend churches on a regular basis (Jo et al., 2010). They attend church services regularly not only for worship, but also for cultural ties as well as to share information and to obtain advice on issues related to daily

living (Kim & Sarna, 2004; Min, 1992). In addition, Korean churches have been utilized to provide health information and services to the church members. Korean Americans prefer to receive health information in church settings (Kim & Sarna, 2004). Therefore, Korean churches would be suitable sites to recruit potential participants.

Access to this target population was obtained through the leaders of each church. According to a recent study (Jo et al., 2010), Korean church leaders are very supportive and are open to collaborating with health research projects. They strive to meet the diverse needs of the Korean immigrants including health, legal, and psychological issues because these are important components of their current ministry (Jo et al., 2010).

Research Sample

Participants were recruited by a convenience sampling method. KA women, aged 40 years or older who reside in the Los Angeles County were included; however, women were excluded if they had a history of breast cancer. The sample consisted of 215 KA women aged 40 or older. All participants completed a demographic questionnaire and four more study questionnaires.

Power Analysis

Since the obtained sample was not categorized, the number of participants in each cultural group was not determined until the data were analyzed. Post Hoc analyses were performed to estimate the power to detect significant differences given the composition of the observed sample. These analyses indicated that power was adequate ($\beta >= .8$) to detect group differences in means for the demographic outcomes of age, the immigration age, and number of years in the U.S. as well as the measures of breast cancer knowledge, self-efficacy, and health belief. However, due to the smaller magnitude of mean

differences in the number of mammograms in the past 5 years, power was low (β= .6) for this measure.

The power of chi-square tests was reduced given the small expected values in the *American identity* and *Marginality* groups. Given these findings with the fact that the small sample sizes and unbalanced subgroup sizes also undermine distribution assumptions, it was suggested that interpretation of the Fisher's exact p-values and Kruskall-Wallis p-values be considered as more robust methods for these comparisons.

The power analyses for the logistic regressions indicated adequate power (β=.85 and above) for examining odds ratios for relationship between cultural groups and mammogram status. It also showed strong power for examining demographic characteristics of the total sample in relation to the mammogram status.

Data Collection Instruments

Demographic Data Questionnaire

The demographic data questionnaire was developed by the primary investigator (PI) for this study to collect participants' age, marital status, education level, health insurance coverage status, and employment status. Acculturation proxies (English fluency and immigration age) were included. Years of residence in the United States was obtained by subtracting immigration age from current age. Participants were asked if they ever had a mammogram. If they have never received a mammogram, they were asked to write the reason. If they have received a mammogram, they were asked when their last mammograms were. The participants were also asked to answer how many times they have received mammogram in the past 5 years. Lastly, the participants were asked

whether they had a family history of breast cancer. If so, they were asked to write the family relationship.

Mammography Status

The participant's mammography status was assessed by a self-reporting method. Although self-reported data have limitations including memory decline and social desirability, several studies have indicated a reasonable accuracy and validity in the self-reporting mammography method (Etzi, Lane, & Grimson, 1994; King, Rimer, Trock, Balshem, & Engstrom, 1990). The Forsyth County Cancer Screening Project was designed to assess barriers to cervical and breast cancer screening among women in North Carolina. In order to address the women's barriers to cancer screening, the authors first had to verify the accuracy of the women's self-reported screening tests. The baseline survey of women's self-reported Pap smear and mammography was compared with medical charts to examine the accuracy. Approximately 80 % (441 women) of the women from a total of 555 women who completed the baseline survey was included in the mammography verification. The mammography self-reports were verified by contacting health care facilities. The overall accuracy of self-reports compared with medical records was 77% among low-income minority women participants. The authors concluded that the women's self-reports were fairly accurate and should have little impact on the study project (Paskett, Tatum, Mack, Hoen, Case, & Velez, 1996).

A systematic review and meta-analysis study was also conducted to examine the accuracy of self-reported Pap smear and mammography screening by comparing them with medical records (Howard, Agarwal, & Lywyn, 2009). Mammography showed fairly

high pooled sensitivity (94.9%) and specificity (61.8%). However, it was found that women tended to over-report their participation in health screening in a given timeframe.

Another meta-analysis, which included 29 selected studies, was conducted by a group of researchers to measure the accuracy of self-reported cancer screening histories (Rauscher, Johnson, Cho, & Walk, 2008). Sensitivity was highest for mammogram (0.93); however, specificity was relatively low (0.61) when compared to other screenings. The largest discrepancy was that women consistently underestimated the time frame since their last mammography screening (Caplan, Mandelson, & Anderson, 2003).

Research on the mammography utilization still relies heavily on self-reported data for its convenience and cost. Factors that might influence the women's self-reports include education level, socioeconomic status, and cultural aspect. Therefore, it is important to reexamine whether the questions are clear and appropriately-worded socio-culturally to maximize the accuracy of the self-report (Paskett et al., 1996).

In the current study, participants were asked about both their recent and regular mammogram utilization. According to American Cancer Society recommendations, having an up-to-date mammography (or recent mammography use) is defined as having had a mammogram within the past year, and regular mammography use is defined as having had an annual mammogram in each of the last 5 years (Wu & Ronis, 2009).

Acculturation

Acculturation was measured by the Vancouver Index of Acculturation (VIA) scale. The study variables and instruments are presented in Table 1. The VIA scale is a 20-item, self-report acculturation scale which measures heritage culture orientation and host culture orientation independently. The responses are rated on a 9-point Likert-type

scale from 1 (strongly disagree) to 9 (strongly agree). The VIA scale consists of two subscales that separately assess the degree to which an individual acculturates to the heritage culture and the host culture. Heritage subscale was 0.91; 0.92 and Mainstream subscale 0.89; 0.85 in the Chinese and the East Asian samples, respectively. Validity of this instrument was established through both concurrent validity and factorial validity tests (Ryder, Alden, & Paulhus, 2000).

The VIA scale was selected because this scale was developed based on the current concept of bidimensional acculturation model, and it was also developed for use with all ethnic groups rather than specific ethnic groups. Therefore, this instrument became popular among researchers to measure acculturation in various groups including Korean Americans (Choi et al., 2009; Huynh, Howell, & Benet-Martinez, 2009).

This instrument was translated into Korean in a study done by Choi et al. (2009). This previous study was conducted to identify the acculturation levels of subgroups of Korean immigrant women by utilizing this VIA scale and to determine the differences in depressive symptoms. In that study, Cronbach's alpha coefficient was 0.79 for the Korean culture subscale and 0.83 for the American culture subscale. The Korean translated instrument was obtained by contacting the author.

For the purpose of this study, KA women were divided into the four cultural groups depending on their scores on the VIA scale. KA women were assigned to the *American identity* group when women received the mean score of more than 5 on the American subscale and the mean score of less than 5 on the heritage subscale. *Korean identity* was when a group of women received the mean score of more than 5 on the heritage subscale and the mean score of less than 5 on the American subscale. *Bicultural*

was when a group of women received the mean score of more than 5 on both subscales. *Marginality* was when a group of women received the mean score of less than 5 on both subscales. The PI contacted Dr. Ryder (the author) regarding the use of this instrument and the scoring method of the VIA scale for this study. Permission was granted by Dr. Ryder for the proposed scoring method and interpretation of scoring to meet the purpose of this dissertation.

Table 1

Study Variables and Instruments Psychometrics Properties

Variables	Instruments	Description	Reliability	Validity
Acculturation	Vancouver Index of Acculturation (VIA) (Ryder, et al., 2000)	20-item, self-report instrument (10-item Heritage subscale, 10-item Mainstream subscale	Heritage subscale $\alpha = 0.91$;$\alpha = 0.92$ Mainstream subscale $\alpha = 0.89$; $\alpha = 0.85$ in the Chinese and the East Asian samples, respectively	Established through both concurrent validity and factorial validity tests
	VIA-Korean (Choi et al., 2009)	1 (strongly disagree) to 9 (strongly agree)	Korean culture subscale $\alpha = 0.79$ American culture subscale $\alpha = 0.83$	
Health Beliefs	The Revised Champion Health Belief Model Scale (CHBMS) (Champion, 1999)	19-item scale using a five-point (1-5) Likert, with the following given responses:	Susceptibility scale $\alpha = 0.87$; Benefit scale $\alpha = 0.75$; Barrier scale $\alpha = 0.88$	Content validity by both expert and focus groups of women react to items

	CHBMS-K (Lee et al., 2009)	"strongly agree", "agree", "undecided", "disagree" and "strongly disagree"	Susceptibility $\alpha = 0.85$; Benefits $\alpha = 0.83$; Barriers $\alpha = 0.71$	Construct validity was supported by exploratory and confirmatory factor analysis
Self-efficacy	The Self-efficacy Scale for Mammography (Champion et al., 2005)	10 items using a five-point (1-5) Likert ranging from Strongly Agree (5) to Strongly Disagree (1)	$\alpha = 0.87$	Confirmatory factor analysis Further construct validity was tested by validating relationships of constructs based on Bandura's theory
Knowledge	The Comprehensive Breast Cancer Knowledge (BCK) Test (Stager, 1993)	12 items-general knowledge 8 items - curability "true/false" questions	The general knowledge subscale: $\alpha = 0.60$ The curability subscale: $\alpha = 0.71$	Content validity was established by four experts in the field of oncology

Health Beliefs

The Revised Champion HBM Scale (CHBMS) by Champion (1999) was used to measure health belief. It is a 19-item scale using a five-point (1-5) Likert, with the following given responses: "strongly agree (1)", "agree (2)", "neutral (3)", "disagree (4)", and "strongly disagree (5)." *Perceived susceptibility* to breast cancer was assessed by a

three-item subscale that examined personal threat or harm related to breast cancer. The lower scores indicated that women felt a greater risk of contracting breast cancer. A sample item was "It is likely that I will get breast cancer."

Perceived benefits of mammography were measured by a five-item subscale that examined the positive outcomes of mammography. For example, "Having a mammogram will help me find breast lumps early." The higher scores indicated that women perceived little benefits in having a mammogram. *Perceived barriers* to mammography were assessed by an 11-item subscale that examined perceived emotional, physical or structural concerns related to mammography. A sample item was "Having a mammogram is too embarrassing." The higher scores indicated lower levels of perceived barriers. Champion (1999) revised the initial scales for benefits and barriers to be mammography-specific. All revisions included testing for content and construct validity, as well as internal consistency and test-retest reliability. The reliability was measured by Cronbach's alpha coefficient and the levels were 0.75 for benefits, 0.88 for barriers, and 0.87 for susceptibility. *Perceived susceptibility* showed the highest internal consistency reliability across studies.

However, because of the lack of variation in *perceived severity* in the previous studies, this construct has been less frequently measured in more recent mammography studies. *Cues to action* are also not included in this revised CHBMS because of the lack of known impact on behavior changes (Champion, 1999; Glanz et al., 2008).

The Korean translated CHBMS was used in a previous study (Lee et al., 2009) and Cronbach's alpha coefficient was as follows: 0.85 for the *perceived susceptibility* subscale; 0.83 for the *perceived benefits*; and 0.71 for the *perceived barriers*. Construct

validity was supported by exploratory and confirmatory factor analyses in that previous study. This CHBMS-K was obtained by contacting the author.

Interpretation of the internal consistency analyses was made using the scale suggested by George and Mallery (2003). The overall Health Beliefs Model (HBM) scale yielded an acceptable/moderate Cronbach's alpha level of 0.78 in this study. The internal consistency of each of the HBM subscales: the *perceived susceptibility* scale; the *perceived benefit* scale; and the *perceived barrier* scale were 0.93, 0.84, and 0.84 respectively in this current study.

Self-efficacy

The Self-efficacy Scale for Mammography was used to measure perceived self-efficacy in this study. This scale was developed by Champion, Skinner, and Menon (2005) to measure mammography-related self-efficacy which is a woman's confidence in her ability to complete steps needed to obtain a mammogram. This instrument consists of 10 items using a five-point (1-5) Likert ranging from "strongly agree (5)", "agree (4)", "neutral (3)", "disagree (2)", and "strongly disagree (1)." These ten items fit the conceptual definition of self-efficacy. Reliability and validity were tested among a sample of 1,233 women. The Cronbach's alpha correlation coefficient was 0.87 and validity was tested through confirmatory factor analysis. Further construct validity was tested by validating relationships of constructs based on Bandura's theory. Self-efficacy significantly predicted mammography use and demonstrated change over time (Champion et al., 2005). This instrument was translated into Korean to be used in a federally-funded study. The outcome of the paper will be published in the near future (Menon, Szalacha, & Lee, in progress). The Korean translated version of this instrument

was obtained through Dr. Lee (the author and a committee member). The Cronbach's alpha coefficient level of self-efficacy was 0.90 in this study.

Breast Cancer Knowledge

The Comprehensive Breast Cancer Knowledge (BCK) Test was selected to measure KA women's knowledge regarding breast cancer and screening guidelines. The Comprehensive BCK test was developed to be used in conjunction with the original BCK test. The original BCK test was developed to address the influence of knowledge about breast cancer screening on actual screening practices including breast self-examination (BSE), mammography, and clinical breast examination (McCance, Mooney, Smith, & Field, 1990). However, the questions mainly focus on the BSE skills that are less relevant to current mammography guidelines and breast cancer knowledge; therefore, the original BCK test was not included in this study.

The Comprehensive BCK test contains two subscales including 12 items of general knowledge and 8 items of curability. They are all "true/false" questions. This test was developed to determine the woman's general knowledge of breast cancer including risk factors and prevalence of breast cancer and her knowledge of breast cancer curability in terms of different treatment modalities. This test also explores the relationship between knowledge of breast cancer and utilization of screening practices (Stager, 1993).

Translation process. Currently, the Comprehensive BCK test is not available in Korean. Translation into Korean was required in order to administer the BCK test to KA women. The process of translating an English version of the instrument into another language is not a simple process. The integral part of translation is to achieve equivalence to the original instrument. Therefore, developing a culturally equivalent translated

instrument requires a methodical approach recommended by people experienced in cross-cultural research (Hilton & Skrutkowski, 2002).

It is important to decide what translation method will be employed in order to obtain a culturally equivalent instrument. When translating an existing instrument, three translation methods have been identified: one-way translation, translation by committee, and double or back translation (Carlson, 2000). The back-translation method has been considered the most preferred method of obtaining a culturally equivalent instrument. This method requires a minimum of two independent translators. The first translator produces the target-language version from the original. The second translator uses the target-language version to produce the instrument in the original language. Each translator works independently and the researcher can consult with both translators to identify reasons for any discrepancies, and inconsistencies can be adjusted.

While this procedure has been considered the optimal method of translating an existing instrument into another language, limitations still exist (Geisinger, 1994). It is time-consuming and impractical for multilingual studies, and differences may still exist between the original and back-translated versions. Keeping grammatical forms intact may result in a confusing and awkwardly phrased translation. These limitations of the back-translation method can be minimized by utilizing an "adaption" technique rather than simply translating the text (Geisinger, 1994).

For the current study, the Comprehensive BCK test was translated into Korean using the most commonly recommended back-translation method. A bilingual and bicultural nurse translated the instruments into Korean. When the first draft of the Korean version was completed, it was given to a bilingual nurse educator to back-translate it into

English. It was also verified by a bilingual English major college student. The results revealed that most items were clear, but some items needed further revision. Then, the PI consulted with both translators to resolve the discrepancies. With everyone's consensus, the Korean-translated BCK test reached the final version and retained all 20 questions from the original test. It was noticed that some English words could not be translated because Korean simply did not have those same words. Therefore, variation should be considered when translating into other languages because interpretation of items may be influenced by culture-specific words and cultural differences (Carlson, 2000). This Korean-translated BCK test was then pilot-tested with a convenience sample of 15 KA women aged 40 or older who were not involved in this study to ensure appropriateness of words and cultural acceptance. This questionnaire was well accepted by KA women and no problematic or awkward sentences were identified.

Data Collection Procedures/Management

Participants were recruited from a number of Korean churches. The pastors from each church were contacted through personally known church leaders to obtain permission for data collection. Each pastor was informed of the purpose of the study and participant-recruitment plan. A letter of support was then obtained from each pastor. Each pastor made a brief IRB approved announcement to all church members about this research study at the end of each service and asked church members' active participation. The additional details about the study were provided by the PI in small group gatherings or individually. Potential participants were contacted at the lunch gatherings after Sunday services. In addition, several visits to special group meetings (the choir, the bible study

group, and the Mothers group) were made to recruit maximum participants. Return visits to a specific location were also made if additional recruitment was warranted.

All women who were interested in the study were screened according to the eligibility criteria by the PI. Once eligible KA women agreed to participate in the study, they were given an IRB approved consent form to review and sign. Once the informed consent was obtained from each participant by the PI, the participants were then asked to complete a paper-and-pencil type of the demographic data questionnaire, the VIA scale, the HBM scale, the self-efficacy scale, and the comprehensive BCK test. Study questionnaires were available in both English and Korean. Approximately 20 minutes were required to complete the questionnaires. Immediately after data collection from a participant, the surveys were reviewed by the PI for any missing data and the participant was then asked to complete any missing questions if applicable. Individual meetings were also arranged at a later time for women who were not able to complete the study questionnaires at that time or needed help reading the questionnaires. Upon completion of the questionnaires, all participants were given a small gift (a $5.00 bag of trail mix from Trader Joe's) personally for their time and for taking part in this study. All questionnaires were coded by numbers and no identifying information was used. All study forms and informed consents were kept in a locked cabinet.

Data Analysis

All data were manually entered into a spreadsheet using code numbers for each participant. The data analysis began by dividing the participants into four groups (*American identity, Bicultural, Korean identity, and Marginality*) according to their scores on the VIA scale.

1) KA women who received the mean score of more than 5 (>5) on the American subscale and the mean score of equal to or less than 5 (≤ 5) on the heritage subscale were assigned to the *American identity* group (n = 7).
2) KA women who received the mean score of more than 5 (>5) on the heritage subscale and the mean score of equal to or less than 5 (≤ 5) on the American subscale were assigned to the *Korean identity* group (n = 116).
3) KA women who received the mean score of more than 5 (>5) on both subscales were assigned to the *Bicultural* group (n = 69).
4) KA women who received the mean score of equal to or less than 5 (≤ 5) on both subscales were assigned to the *Marginality* group (n = 23).

Due to the disproportionate number of participants in each cultural group, an agglomerative, hierarchical cluster analysis was performed using weighted average linkage as the alternate clustering (grouping) method. The results of this cluster analysis supported the use of the proposed scoring method and identified four as the most appropriate number of groups for the data.

SAS software (version 9.2) was used for all analyses, and an alpha level of .05 ($p < 0.05$) was employed for all tests of statistical significance. Descriptive statistics including means, standard deviations, and ranges were performed to describe the continuous variables of participants' demographic information in each cultural group. Percentage was used to describe the categorical variables. Because of the unbalanced group sample sizes and the relatively small sizes in the *Marginality* group and *American identity* group, non-parametric and parametric procedures were used to assess group differences on demographic and outcome variables when possible. Post-hoc power

analyses were performed to understand the impact of the obtained sample sizes in terms of the power of differences and interpretation of significance.

The four cultural groups were evaluated for differences in several demographic characteristics. Fisher's exact tests were used to evaluate group differences in the categorical variables, such as education level, employment status, marital status, health insurance status, English proficiency, and family history of breast cancer. Kruskall-Wallis tests (a non-parametric corollary to one-way ANOVA) were performed in addition to ANOVA to test for group differences in the continuous variables, such as age, immigration age, years of residency in the U.S., and number of mammograms in the past five years.

The primary outcomes investigated were the measures of health beliefs (subscales of susceptibility, benefits, and barriers), self-efficacy, and breast cancer knowledge (total and subscales of general knowledge and curability), as well as the probability of getting mammograms. Kruskall-Wallis tests and ANOVA were performed to examine differences among the four cultural groups in each outcome and subscale. Where a significant overall relationship was found between cultural groups and outcomes, post hoc Bonferonni adjusted mean comparisons were performed to evaluate which groups differed from one another. Tests of internal consistency, measured by Cronbach's alpha correlation coefficient, were performed for each of the health beliefs subscales and self-efficacy scale.

Logistic regression analyses were performed to determine odds ratios and significant differences among the cultural groups in the probability of getting a recent mammogram, and likelihood of getting regular mammograms. In addition, logistic

regression was performed to examine the relationship between the demographic variables and the probability of getting a recent mammogram and the likelihood of getting regular mammograms in the total sample.

Human Subjects Considerations

This study was reviewed by the institutional review board of the University of San Diego. Participants were given the IRB approved consent to read and had the chance to ask questions if necessary. All participants were assured of their anonymity in data collection. The participants were also informed that their participation was voluntary and that all information provided was confidential.

Risks and Benefits

This study did not involve apparent risk; however, a few elderly participants felt mild fatigue in completing all the questionnaires. There were no direct benefit to participants from participating in this study; however, participants' awareness of the importance of getting a mammogram has been heightened. Participants also understood that they contributed to an important research that would potentially benefit them by helping researchers understand the relationship between the level of acculturation and mammography utilization among KA women.

Summary

This cross-sectional descriptive study was designed to examine the relationship between the level of acculturation and mammography utilization among Korean American (KA) women. A convenience sampling method was utilized to recruit KA women in several local Korean churches in the Los Angeles County. Several instruments were used to collect data regarding study variables. Descriptive and inferential statistical tests were used to analyze the data and to address each study aim.

CHAPTER IV

RESULTS

The purpose of this study was to examine the relationship between the level of acculturation and mammography utilization among Korean American (KA) women. The specific aims of this study were to describe the differences in demographic characteristics and mammography utilization status among the four cultural groups (*American identity, Bicultural, Korean identity, and Marginality*), to determine if there are significant differences in health beliefs, self-efficacy, and knowledge of breast cancer screening among the four cultural groups, and to examine the effects of the level of acculturation on the likelihood of getting a mammogram screening. The overall findings of this study are presented in this chapter. The participants' demographic characteristics in each cultural group are briefly described first. The findings related to each specific aim are then presented.

Demographic Characteristics by Cultural Group

A total of two hundred fifteen ($N = 215$) KA women participated in this study. Based on their VIA scale scores, these women were divided into four cultural groups. The sample size of each cultural group was as follows: *Korean identity* group =116,

Bicultural group = 69, *Marginality* group = 23, and *American identity* group =7. Participants completed all of the measures analyzed. The demographic characteristics of each group are briefly discussed here.

***Korean identity* Group**

The average age of women in the *Korean identity* group was 56 (*SD* =11.75). More than half of the women in this group were college graduates (59.5%) and employed (52.6%). However, 40 % of these women did not have any health insurance coverage. Sixty percent of the women identified themselves as "a little" in English proficiency.

***Bicultural* Group**

The average age of women in the *Bicultural* group was approximately 56 (*SD* =10.00). KA women in this group have lived the same number of years in Korea and in America (*M* = 28). A high percentage of women in this group were college graduates (62.3 %) and employed (68.1 %). Half of these women had private health insurance coverage. The majority of the women in the group spoke English at a moderate level (60.9 %).

***Marginality* Group**

The average age of women in the *Marginality* group was approximately 59 (*SD* =11.23). A high percentage of the women in this group were employed (65.2 %). Only twenty six percent of the women had private health insurance coverage. The majority of the women in the group spoke English at a minimum level (56.5 %).

***American identity* Group**

The average age of women in the *American identity* group was approximately 66 (*SD* =7.79) and the average length of residence in the United States was 31 years (*SD*=

10.09). The same percentage of women was either working or retired (42.9 %). More than half of the women in this group had government insurance coverage (57.1%). None of the women in this group reported having a family history of breast cancer.

Group Differences in Demographics and Mammogram Status

The first specific aim of this study was to describe the differences in demographic characteristics and mammography utilization status among the four cultural groups (*American identity, Bicultural, Korean identity, and Marginality*) of KA women. Table 2 and 3 display the several demographic characteristics of each cultural group and the results of the corresponding significance tests. The descriptive statistics for the categorical variables are shown in Table 2, and the statistics for the continuous variables are shown in Table 3.

Table 2

Group Differences in Demographic Characteristics for Categorical Variables

Variables	*Bicultural* (%)	*Korean identity* (%)	*Marginality* (%)	*American identity* (%)	P-Value
Marital Status					.067
Single	4.4	4.3	8.7	14.3	
Widow/ divorced/separated	18.8	11.2	30.4	28.6	
Married	76.8	84.5	60.9	57.1	
Education Level					.143
High school graduate or less	13.0	25.9	34.8	14.3	
College graduate	62.3	59.5	43.5	71.4	

Graduate school	24.6	14.7	21.7	14.3	
Employment Status					.017*
Unemployed	11.6	34.5	17.4	14.3	
Employed	68.1	52.6	65.2	42.9	
Retired	20.3	12.9	17.4	42.9	
Health Insurance					.077
None	27.5	40.5	34.8	14.3	
Medical/Medicare	21.7	24.1	39.1	57.1	
Private Insurance	50.7	35.3	26.1	28.6	
English Proficiency					<.001*
A little	20.3	60.3	56.5	28.6	
Moderate	60.9	34.5	39.1	42.9	
Fluent	18.8	5.2	4.4	28.6	
Family History					.327
Yes	7.3	15.5	8.7	0.0	

Note. *Significant at the P< 0.05 level based on Fishers exact test

Table 3

Group Differences in Demographic Characteristics for Continuous Variables

Variables	*Bicultural*	*Korean identity*	*Marginality*	*American identity*	P-value
	Mean ±SD (Range)	Mean ±SD (Range)	Mean ±SD (Range)	Mean ±SD (Range)	
Age	56.06±10.00 (40-81)	55.81±11.75 (40-90)	59.30±11.23 (40-78)	66.57±7.79 (60-79)	.029*
Immigration age	27.68±8.49 (12-60)	35.69±13.87 (3-75)	34.5±8.91 (23-55)	35.43±9.78 (22-50)	<.001*
Years in the U.S.	28.38±10.39 (6-51)	20.12±11.63 (1-65)	24.74±11.98 (1-47)	31.14±10.09 (10-41)	<.001*
Number of Mammograms in the past 5 years	2.38±1.77 (0-5)	1.78±1.50 (0-5)	1.87±1.69 (0-5)	2.57±1.62 (0-5)	.106

Note. *Significant at the P< 0.05 level based on Kruskall-Wallis tests

There were significant differences among the groups in age (p= .029), immigration age (p < .001), years lived in the U.S. (p < .001), and English fluency (p < .001). The *American identity* group was older than the other cultural groups. The mean age of the *American identity* group was 66.6 (*SD* = 7.79). The range of the other groups' mean ages was between 55 and 60. The *Bicultural* group reported being younger when they immigrated to the U.S. compared to the other cultural groups. The mean immigration age of KA women in the *Bicultural* group was 27.7 (*SD* = 8.49) while the other groups' mean immigration ages were over 35.

The *American identity* and *Bicultural* groups had been in the U.S. the longest (31.4 years and 28.4 years, respectively), followed by the *Marginality* and *Korean identity* groups (24.7 years and 20.1 years, respectively). The *Korean identity* and *Marginality* groups had higher rates of "a little" in English proficiency (60.3 % and 56.5 % respectively). Although the overall "fluent" rate was low in the *Bicultural* and *American identity* groups (18.8 % and 28.6 % respectively), it was relatively higher than the other two group rates (*Korean* and *Marginality* groups, 5.2 % and 4.4 % respectively).

Employment status was also found to vary significantly among the groups (p = .017). Within each group, the majority of the participants were employed, but the *American identity* group showed a higher rate (42.9%) of retired participants, and the *Korean identity* group showed higher rates of unemployment (34.5%). The percentage of unemployment in the other groups was between 11 and 17%. The *Bicultural* group had the most employed KA women (68 %).

There were no significant group differences in marital status, education level, health insurance coverage, or family history of breast cancer. The majority of the participants in each group were married. A high percentage of participants in each group reported having a college education. Although there was no significant group difference in health insurance coverage status, the *Bicultural* and *American identity* groups reported having a higher rate of health insurance. Half of the *Bicultural* group (50. 7%) had private health insurance whereas more than half of the *American identity* group (57.1 %) had Medical/Medicare coverage. Family history of breast cancer was not significantly different among the four groups. The highest percentage (15.5%) of family history was

shown in the *Korean identity* group while no one in the *American identity* group reported having a family member with breast cancer.

Although the differences did not reach statistical significance, there were some trends among the groups in mammogram history. Table 4 displays the group differences in mammogram history.

Table 4

Group Differences in Mammogram History

Mammogram History	*Bicultural* (%)	*Korean identity* (%)	*Marginality* (%)	*American identity* (%)	P -value
Last Mammogram					.592
0 (Never)	11.6	17.2	17.4	14.3	
1 (within 1 year)	46.4	43.1	26.1	57.1	
2 (more than 1 year)	42.0	39.7	56.5	28.6	
Regular Mammogram (every year for the past 5 years)	21.7	8.6	8.7	14.3	.063

Note. *Significant at the $P < 0.05$ level based on Fishers exact test

The *Korean identity* and *Marginality* groups had slightly higher rates of never having a mammogram (17.2 % and 17.4 %, respectively). These groups also had lower rates (43.1 % and 26.1 % respectively) of getting a mammogram in the past year compared to the *American identity* and *Bicultural* groups (57.1 % and 46.4 %

respectively). The *Marginality* group had the lowest number of participants having a mammogram in the past year while the *American identity* group had the most (26.1% and 57.1%, respectively).

The *Korean identity* and *Marginality* groups demonstrated lower rates of receiving regular mammograms (8.6 and 8.7 %). The *Bicultural* group had the highest rate of regular mammograms (21.7 %) followed by the *American identity* group (14.3%). The *Korean identity* and *Marginality* groups also reported a lower average number of mammograms in the past 5 years than the other two groups. However, all four groups showed that greater than 80% of their participants had received a mammogram at least once in the past.

Group Differences in Health Beliefs and Self-efficacy

The second research aim was to determine if there was a significant difference in health beliefs and self-efficacy among the four cultural groups. Table 5 shows the mean scores for the health beliefs and self-efficacy of each cultural group. The results of the Kruskall-Wallis tests for group differences are also displayed.

Table 5

Group Differences in Health Beliefs and Self-efficacy

Health Beliefs & Self-efficacy	*Bicultural*	*Korean identity*	*Marginality*	*American identity*	P-value
	Mean ±SD (Range)	Mean ±SD (Range)	Mean ±SD (Range)	Mean ±SD (Range)	
Susceptibility (Range 3-15)	13.06 ±2.31 (3- 15)	12.69 ±2.29 (6- 15)	12.04 ±2.94 (3- 15)	13.57 ±2.30 (9-15)	.283

Benefits (Range 5-25)	12.43 ±4.65 (5-24)	11.38 ±4.55 (5-25)	11.82 ±4.90 (5-25)	17.43 ±5.74 (10-25)	.016*
Barriers (Range 11-55)	42.58 ±7.62 (17-55)	40.26 ±7.40 (14-55)	41.43 ±8.17 (20-55)	48.71 ±5.56 (41-54)	.012*
Self-Efficacy (Range 10-50)	43.04 ±5.18 (27-50)	41.00 ±7.66 (10-50)	39.83 ±8.33 (11-50)	46.00 ±5.39 (37-50)	.054

Note. *Significant at the P< 0.05 level based on Kruskall-Wallis tests

There was no significant difference in the *susceptibility* subscale mean score among the four groups. The range of the scores is between 3 and 15 in this scale. A score of 3 indicates the most perceived *susceptibility* while a score of 15 indicates the least perceived *susceptibility*. The average mean score among groups was 13 (minimum M = 12.04; maximum M = 13.57). The majority of KA women in each group did not feel themselves susceptible to breast cancer in this current study.

Significant differences were found in the perceived *benefits* subscale and the *barriers* subscale. Post hoc mean comparisons of the difference in the *benefits* subscale showed that the *American identify* group had a significantly higher mean score (M = 17.43, SD = 5.74, *Range* 10-25) than each of the other groups (p = .016). The high score in this subscale indicates that a woman perceives few benefits of having a mammogram. The *American identity* group in this current study was less likely to agree with the benefits statements. This group's average response was "neutral (3)" in most items, whereas the other groups' average response was "agree (2)".

The *American identity* group also received the highest mean score (M = 48.71, SD= 5.56, *Range* 41-54) in the *barriers* subscale (p = .012). The high score in the

barriers subscale indicates less perceived barriers of getting a mammogram. Post hoc paired comparisons of the barriers subscale indicated that the only difference to reach significance was between the *American identity* and *Korean identity* groups. While the *American identity* group received the highest score, the *Korean identity* group received the lowest ($M = 40.26$). The average response for the *American identity* group was "disagree (4)" in most items and the average response for *Korean identity* and the other groups was "neutral (3)".

Each group received overall high mean scores on the self-efficacy scale. However, the analyses for group differences on the self-efficacy measures were inconclusive. The mean differences were approaching significance, with the *American identity* group having higher average self-efficacy scores ($M = 46.0$, $SD = 5.39$) and the *Marginality* group showing the lowest ($M = 39.8$, $SD = 8.33$). The overall F test ($p = .048$) was significant, but the Kruskall-Wallis test ($p = .054$) did not reach significance. Furthermore, none of the direct comparisons of the *American identity* group and the other groups reached significance. The majority of the participants in the *American identity* group responded "agree (4)" or "strongly agree (5)".

Group Differences in Breast Cancer Knowledge (BCK)

The third research aim for this study was to determine if there was a significant difference in knowledge of breast cancer screening among the four cultural groups. A Breast Cancer Knowledge (BCK) score was computed by totaling the number of correct answers for all items. Table 6 displays group differences in breast cancer knowledge. Analyses of the BCK total and curability indicated some trends of variation between the groups, but the significance tests were inconclusive.

Table 6

Group Differences in Breast Cancer Knowledge (BCK)

Breast Cancer Knowledge	*Bicultural*	*Korean identity*	*Marginality*	*American identity*	*P*-value
	Mean ±SD (Range)	Mean ±SD (Range)	Mean ±SD (Range)	Mean ±SD (Range)	
BCK General (12 items)	7.54 ±1.70 (4-12)	7.55 ±1.61 (3-10)	6.83 ±1.80 (4-10)	7.29 ±1.25 (5-9)	.271
BCK Curability (8 items)	5.44 ±1.58 (0-8)	5.47 ±1.55 (1-8)	4.87 ±1.77 (2-8)	3.86 ±2.05 (1-7)	.069
BCK Total (20 items)	12.99 ±2.31 (7-17)	13.03 ±2.16 (5-17)	11.69 ±2.53 (7-17)	11.14 ±2.85 (8-16)	.029*

Note. *Significant at the P< 0.05 level based on Kruskall-Wallis tests

There was no significant group mean score difference in the BCK General questions although the *Marginality* group received the lowest scores (M = 6. 83, SD = 1.80) among groups. Interestingly, the *American identity* group received the lowest scores (M =3. 86) when compared with other groups in the BCK curability items although an overall difference in mean did not reach significance (p = .069). None of the direct comparisons reached significance when applying the adjustment for multiple comparisons.

For the BCK Total measure, an overall group difference (p = .029) in mean was detected by Kruskall-Wallis test. However, none of the direct comparisons among groups reached significance when applying the adjustment for multiple comparisons. The

Korean identity groups showed the highest total score (*M*= 13.03) followed by the *Bicultural* group (*M* = 12.99).

Effects of the Level of Acculturation on Mammography Utilization

Lastly, this study was interested to examine the effects of the level of acculturation on the likelihood of getting a mammography screening. Table 7 displays results of logistic regression and odds ratios (OR) for each cultural group compared with the *Korean identity* group. The *Korean identity* group was chosen as a referent group because this group is more 'extreme' conceptually in the acculturation level. There were no significant differences among the groups in the OR for getting a recent mammogram when compared with the *Korean identity* group.

For the regular mammogram, the *Bicultural* group was significantly more likely than the *Korean identity* group to receive regular mammograms (*OR* = 0.34, *CI* = 0.143, 0.806). The *Bicultural* group is 2.94 times (inverse interpretation = 1/0.34) more likely to receive regular mammograms than the *Korean identity* group. Although the *Marginality* group had nearly the same odds ratio as the *Korean identity* group (*OR* = 0.34), the result was likely due to the small group size/larger variance.

Table 7

Logistic Regression for Recent and Regular Mammogram

Cultural Groups	Odds Ratio for **recent** mammogram	CI	*P*-value	Odds ratio for **regular** mammogram	CI	*P*-value
Korean identity	1.00			1.00		

Marginality	0.44	0.167-1.175	.102	0.61	0.135-2.760	.521
American identity	1.68	0.365-7.694	.507	1.07	0.123-9.236	.953
Bicultural	0.88	0.481-1.595	.664	0.34	0.143-0.806	.014*

Note. CI indicates Confidence Interval; *Significant at the P< 0.05 level

Effects of the Overall Demographic Variables on Mammography Utilization

In order to increase understanding of the determinants of getting a mammogram, additional logistic analyses were done based on the current data. Table 8 displays the overall results of logistic regression and odds ratios (OR) evaluating potential relationships between demographic variables and mammography utilization in the total participants.

Table 8

Logistic regression for Demographic Variables and Mammogram (N = 215)

Variables	Categories	Odds ratio (OR) for **Recent** mammogram (Confidence interval= CI)	*P*-value	Odds ratio (OR) for **Regular** mammogram (Confidence interval= CI)	*P*-value
Education level	High school	1.00		1.00	
	College	1.79 (0.895 -3.59)	.100	1.94 (0.623 - 6.01)	.254
	Graduate school	1.33 (0.557 - 3.19)	.518	1.57 (0.392 - 6.30)	.523

Employment status	Unemployed	1.00		1.00	
	Employed	1.04 (0.538 - 2.00)	.915	0.54 (0.203 - 1.43)	.212
	Retired	1.91 (0.808 - 4.49)	.141	1.88 (0.646 - 5.44)	.247
Health Insurance	Uninsured	1.00		1.00	
	Medical/ Medicare	1.13 (0.550 - 2.32)	.738	1.92 (0.625 - 5.88)	.253
	Private insurance	2.18* (1.15 - 4.13)	**.017***	2.30 (0.836 - 6.33)	.107
English Proficiency	Little English	1.00		1.00	
	Moderate English	1.30 (0.730 - 2.30)	.357	1.06 (0.451 - 2.50)	.892
	Fluent English	1.93 (0.759 - 4.89)	.168	1.61 (0.466 - 5.57)	.451
Family history	None	1.00		1.00	
	Yes	1.84 (0.788 - 4.24)	.160	0.55 (0.122 - 2.46)	.434
Age	Per 5 years	1.02 (0.995 - 1.05)	.117	1.22* (1.01 - 1.08)	**.024***
Immigration age	Per 10 years	1.00 (0.979 -1.02)	.974	1.04 (0.973 - 1.04)	.801
Years in the U.S.	Per 10 years	1.02 (0.994 - 1.04)	.148	1.03 (0.999 - 1.07)	.059

Note. *Significant at the P< 0.05 level

Health insurance status was the only variable significantly related to receiving a recent mammogram among KA women in this study (*OR*=2.18, *CI*= 1.15, 4.13). Participants who have private health insurance are two times more likely to receive a recent mammogram than women who do not have any health insurance. However, having health insurance did not predict regular mammograms among KA women in this study. Furthermore, having Medical or Medicare insurance did not predict recent or regular mammogram.

Age was the only variable where the OR reached significance (p = .024) for likelihood of receiving regular mammograms. However, the magnitude of the difference was quite small (*OR* = 1.22, *CI*= 1.01, 1.08) and this means that the likelihood of receiving regular mammograms increased by 22% for every 5 year-increase in age. Due to the large ranges in age, immigration age, and length of residency variables, age was re-scaled to a five-year increment, and immigration age and length of residency were re-scaled to a ten-year increment in this analysis as presented in Table 8.

Summary

KA women participating in this study were able to be divided into four cultural groups (*American identity, Bicultural, Korean identity*, and *Marginality* groups) based on their VIA scale scores although the number of samples in each cultural group largely varied. Each group showed unique demographic characteristics. Therefore, there were several significant group differences in demographic variables.

The *American identity* group was older than the other cultural groups. The *Korean identity* group was the youngest among the four groups. There was also a significant group difference in immigration age. KA women in the *Bicultural* group were the

youngest (in their 20's) when they immigrated to the U.S. while women in other groups immigrated at their 30's. KA women in *the American identity* and *Bicultural* groups lived in the United States longer than the two other groups and these women spoke English more fluently than women in either the *Marginality* or *Korean identity* groups.

Although there was no statistically significant difference in mammogram history, the *Korean identity* and *Marginality* groups had slightly higher rates of never having a mammogram. The *American identity* group had the highest rate of recent mammograms while the *Marginality* group had the lowest rate. The *Korean identity* and *Marginality* groups demonstrated lower rates of receiving regular mammograms and also lower average number of mammograms in the past 5 years. The *Bicultural* group had the highest rate of regular mammograms followed by the *American identity* group.

Significant differences were found in the perceived benefits subscale and barriers subscale. The *American identity* group had significantly higher mean scores than each of the other groups in the perceived benefits subscale. The *American identity* group also received the highest mean score in the barriers subscale while the *Korean identity* group received the lowest. For the self-efficacy mean scores, the *American identity* group received the highest average self-efficacy scores while the *Marginality* group showed the lowest scores. The analyses of the BCK questionnaire were inconclusive. Both *Bicultural* and *Korean identity* groups received higher scores on the curability subscale and total score. No difference was found between groups in the BCK General subscale.

Logistic Regressions investigating the likelihood of receiving mammograms demonstrated that the *Bicultural* group is significantly more likely to receive regular mammograms when compared with the *Korean identity* group. In the additional logistic

regression analysis on demographic variables and mammogram status, it was predicted that participants who have private health insurance are two times more likely to receive a recent mammogram than women who do not have health insurance. Age was another variable that reached significance for likelihood of receiving regular mammograms. The older the KA women the more likely they are to receive regular mammograms.

CHAPTER V

DISCUSSION

The purpose of this study was to examine the relationship between the level of acculturation and mammography utilization among Korean American (KA) women. This chapter discusses the overall findings of this study in relation to other studies. In addition, the strengths and limitations of this study and its implications for future clinical practice and research are presented.

This study was conducted between March and April of 2013 in several Korean churches in the Los Angeles County. The majority of the participants were recruited in Korean churches located in *Koreatown*. The sample consisted of 215 KA women aged 40 or older. All participants completed a demographic questionnaire and four more study questionnaires. Participants were divided into four different acculturation levels depending on their VIA instrument scores. The sample size of each cultural group was as follows: *Korean identity* group =116, *Bicultural* group = 69, *Marginality* group = 23, and *American identity* group =7. This study was unique in that no previous studies have compared four different cultural groups in regards to mammography utilization.

Demographics Differences and Mammogram Utilization

In this study, the length of residency along with age was identified as important factors that could determine the level of acculturation. KA women in each extreme acculturation level have showed obvious demographic differences. The *American identity* group was older while the *Korean identity* group was the youngest. This finding is in line with the length of U.S. residency of these groups. KA women in the *American identity* group have lived in the U.S. the longest (almost 50 % of their lifetime) while the *Korean identity* group has resided in the U.S. the least amount of years compared to other cultural groups.

KA women in the *American identity* group have become accustomed to American culture and they scored high on the American culture subscale while KA women in the *Korean identity* group maintained a strong Korean heritage cultural orientation and a weak American cultural orientation. These findings are consistent with the previous study where the VIA scale was also utilized to divide Korean Americans into four cultural clusters. It was found in that study that the American group had lived the longest years in the U.S. and Korean group had lived the shortest years in the U.S. (Choi et al., 2009). Therefore, it was evident that the length of U.S. residency played an important role in the acculturation process.

The findings of this study partially supported the hypothesis about the relationship between the level of acculturation and mammography status among KA women. It was found that more acculturated KA women had higher rates of screening mammograms. The *American identity* group had the highest rate of having had a recent mammogram within the past year in the current study. The higher recent mammogram rate shown in the older *American identity* group in this study is supported by other previous studies. It

was found that women who had had a mammogram were significantly older than those who had never had one (Lee et al., 2009). It was also reported that age was related to regular mammograms in that KA women older than 50 and older were two times more likely to receive regular mammograms (Juon et al., 2004).

Interestingly, the age at which these women immigrated to the U.S. did not identify as a predictor for acculturation in this study. There was no difference in the mean immigration age between *Korean identity* and *American identity* groups. KA women from these two groups immigrated to the U.S. when they were approximately 35 years old. The finding of this current study supports the classic definition of acculturation that cultural changes occur as a result of continuous contact with different cultures (Redfield et al., 1936). The longer the KA women were exposed to American culture, the stronger the development of American culture orientation, regardless of immigration age.

The level of English proficiency was significantly different among the four groups in this study. More than half of the KA women in the *Korean identity* and *Marginality* groups spoke minimal levels of English. KA women in the *American identity* group spoke more fluent English than women in other groups. This finding indicated that English proficiency is also a significant factor that could predict acculturation level. KA women who had a higher American culture orientation reported having higher English proficiency while women who remained in Korean culture had the lowest English proficiency level. This result is in line with a previous study that stated that the number of years in the United States was positively related to the ability to speak English among 180 Chinese and Korean American women (Yu et al., 2003).

It was also found in this current study that English fluency was associated with receiving screening mammogram. More acculturated KA women in *American identity* group spoke English more fluently and had received the highest rate of recent mammogram. Similarly, English proficiency was the strongest predictor of mammography use in the past 2 years in a previous study (Yu et al., 2003). These results are also supported by another study stating that women who spoke English either very well or moderately were more likely to have regular mammograms than those who had poor English proficiency (Juon et al., 2004). Similar findings were again presented in another study that stated that spoken English proficiency was also associated with having mammogram screenings among KA women in that study (Choi et al., 2010).

However, it was found in one study that almost 80 % of participants had lived in the United States for more than 10 years, but only one fifth among 459 KA women aged 40 or older reported speaking English at a fluent level (Juon et el., 2004). Future studies warrant investigation into other possible factors affecting English proficiency among KA women since English ability continues to be an important predictor for mammography utilization in this population.

It was interesting to learn that the results of this study supported the measurement of acculturation by utilizing acculturation proxies in previous studies (Juon et al., 2004; Yu et al., 2003). The length of residency and English proficiency were the most frequently used acculturation proxies. It was reported that women who were not able to speak or read English had experienced difficulties in accessing health care services because they were not able to communicate with health care providers or was not able to obtain free or low-cost community cancer prevention programs (Juon et al., 2004). In this

aspect, the authors (Juon et al., 2004) concluded that acculturation was associated with regular mammogram uptake. In the current study, both these acculturation proxies (the length of U.S. residency and English proficiency) were also associated with the level of acculturation. KA women who identified themselves as more acculturated in the *American identity* group had lived in the U.S. the longest (almost 50% of their lifetime) and spoke English the most fluently.

There was no significant group difference in marital status in the current study. Although the difference was not significant, the *Marginality* group showed the highest divorce/widow/separated rate. This finding may explain acculturative stress and poor psychological adaptation among Korean immigrants who utilize the "*marginalization*" strategy (Berry, 1997). The individual immigrant may experience a number of different psychological conflicts and changes along the process of acculturation. According to Berry (1970), the *integration* strategy leads to the best mental outcomes, whereas *marginalization* leads to the worst outcomes. This finding might be one of the possible reasons for lower rates of recent and regular mammograms in the *Marginality* group. This result is supported by a previous study stating that being married was a positive predictor for having a mammogram in the past 2 years for KA women aged 50 or older (Lew et al., 2003). It was also found that unmarried women were less likely to receive a screening mammogram among 1,786 KA women in California (Lee et al., 2012). For future studies, it would be important to investigate a possible relationship between social support including spousal support and mammography utilization in this population.

Employment status was also found to vary among the groups in this study. The *American identity* group had the most retired participants, and the highest percentage of

KA women in the *Korean identity* group was unemployed when compared with other cultural group. A high number of KA women in the *Bicultural* group was employed. This result corresponded with the health insurance coverage status in this study. Half of the KA women in the *Bicultural* group had private health insurance whereas more than half of the *American identity* group had Medical/Medicare coverage. Nearly half of the KA women in the *Korean identity* group reported having no health insurance. It was found that employment interacts with health insurance status and these factors could determine mammography utilization. Women in the *Bicultural* group also had the highest percentage of private insurance coverage, and they had the highest percentage of regular mammograms. This result is also consistent with a previous study that stated that KA women who had health insurance demonstrated a higher utilization of screening mammograms (Yu et al., 2003). It was also found that KA women employed without health insurance were less likely to have regular mammogram than women employed with health insurance (Juon et al., 2004). Similar findings were presented in another study that stated that employed women were more likely to have a screening mammogram than unemployed women. Further, women with private health insurance were more likely to have a screening mammogram than those who do not (Choi et al., 2010). Therefore, it is important to pay attention to those who are employed without health insurance, such as KA women in the *Marginality* group. These women reported having a high percentage of employment, yet a considerably high percentage of them reported having no insurance. This finding is in line with the result that KA women in the *Marginality* group also showed the highest rate of never having had mammogram.

Overall, a high percentage of participants in each group reported having a college education. Although the difference was not significant, there was a trend that showed that the *American identity* and *Bicultural* groups had a higher college level of education. Therefore, there could be a potential association between education level and mammography utilization since these two groups had higher rates of recent and regular mammograms. This result is consistent with a previous study that stated that KA women who had more than a high school education were more likely to receive regular mammograms (Juon et al., 2004). This result was also supported by another study that reported that more highly educated KA women had 3.12 times higher odds of getting a mammogram screening (Choi et al., 2010). This finding also explained the possible relationship between education level and English proficiency. Less educated KA women in the *Korean identity* and *Marginality* groups also reported having low levels of English proficiency in this study. Therefore, it is important to utilize appropriate education and language levels when developing the education materials for KA women.

There was also no significant difference in family history of breast cancer among the groups. Unlike a previous study that had reported that women with a family history of breast cancer were more likely to have a mammogram than women without such family history (Hailey, Carter, & Barnett, 2000), family history did not affect breast cancer screening behaviors among KA women in this study. The *Korean identity* group had lower screening rates of recent and regular mammograms, yet reported having the highest rate of family history of breast cancer while no one reported having a family member with breast cancer in the *American identity* group. Therefore, family history was not a significant factor for past mammogram utilization by KA women in this study.

The overall average percentage of mammograms among participants in this study was lower than a previous study where the same screening guideline was utilized (Wu & Ronis, 2009). It was reported that 56 % of the participants in that previous study reported having a recent mammogram whereas only 43 % of the participants had a recent mammogram in this study. There was also a great difference in regular mammogram status between these two studies. It was found that 33% of the participants reported having regular mammograms in the previous study whereas only 13 % of the participants from this current study were getting regular mammograms. The potential reason for these differences is that the relatively low screening rates in the *Korean identity* and *Marginality* groups have brought down the overall rate of screening mammograms in this current study. Therefore, it will be important to pay special attention to these less acculturated groups when considering developing research interventions in the future.

However, the overall percentage of KA women who have never received a mammogram was relatively lower than those in previous studies. For example, approximately 31 % among 656 KA women participants reported having never received a mammogram (Sohn & Harada, 2004). Similar findings were also presented in another study done by Lee et al., (2009) which stated that almost 50 % of the participants have never received a mammogram.

Furthermore, greater than 80% of the women in all four groups in this current study received at least one mammogram in their lifetime. This percentage was also higher than findings in other studies. For example, it was presented in a previous study (Juon et al, 2004) that 65.4 % of the participants have ever received a mammogram in the past. Another study done in the Los Angeles County reported that approximately 67 % of the

participants received a mammogram in their lifetime (Sohn & Harada, 2004), and only 50 % of the participants have had a mammogram in the past (Lee et al., 2009). In this study, this higher percentage of ever receiving a mammogram may suggest the inflated mammogram history which can be a result of over reporting by participants.

Although the mammogram status difference between the groups was not statistically significant, there were obvious trends in mammogram history in this study. The more acculturated KA women in the *American identity* and *Bicultural* groups reported having more recent and regular mammograms respectively.

Health Beliefs and Mammography Utilization

Although there were significant group differences in the perceived benefits scores and barriers scores, the findings were inconclusive. Interestingly, KA women in the *American identity* group perceived less benefits of having a mammogram while they also perceived less barriers of getting a mammogram. These findings suggested that a possible reason for some of the KA women in the *American identity* group not receiving a mammogram could be due to a lack of perceived benefits of having a screening mammogram rather than perceived barriers. This finding contradicted with a previous study that stated that perceived barriers were significantly negatively associated with recent mammogram (Wu & Ronis, 2009).

On the other hand, KA women in the *Marginality* group perceived relatively many benefits of getting a mammogram; however, at the same time, they also perceived many barriers of getting a mammogram. This finding indicated that KA women in this group did not receive either recent or regular screening mammograms because of many barriers that they encountered. This finding is consistent with a previous study that stated

that women who perceived relatively high barriers of getting a mammogram were less likely to receive both recent and regular mammograms (Wu & Ronis, 2009). A similar finding was presented in another study that stated that perceived barriers were the most important factors in determining mammogram utilization ((Han et al., 2000).

Since the *American identity* group showed the highest rate of recent mammograms and the *Marginality* group showed the fewest recent and regular mammograms, the perceived barriers was the more influential factor of getting a mammogram than the perceived benefits in this current study. However, these findings are contradictory to a previous study in which women who had had mammograms in the past reported statistically significantly higher benefits scores than those who had not, and perceived barriers did not have predictive ability for mammogram screening (Lee.et al., 2009).

The scores in the susceptibility subscale were very high in all four cultural groups. The majority of KA women in each group did not feel themselves susceptible to breast cancer; therefore, the perceived susceptibility was not a significant determinant for getting a mammogram in the current study. This result is contradictory with previous studies on perceived susceptibility. One study reported that low perception of susceptibility to breast cancer was significantly associated with low rates of mammography utilization, specifically among KA women (Kim et al., 2010) as well as another study indicated that women with higher perceived susceptibility was more likely to have received mammograms in the past (Ham, 2006).

However, this finding of the current study may explain that low perceived susceptibility could play a role as a barrier of getting a screening mammogram among

KA women. It was reported in a study that the main reason for KA women not having mammograms was their belief of a low possibility of getting breast cancer (Juon et al., 2004).

Self-efficacy and Mammography Utilization

Although the statistical differences on the self-efficacy scores among groups were inconclusive, there was an apparent difference between the *American identity* and the *Marginality* groups. KA women in the *American identity* group scored the highest in the self-efficacy scale, which means that these KA women were confident in her ability to locate and contact a mammography-screening center and schedule an appointment (Champion et al., 2009) while women in the *Marginality* group scored the lowest. This result suggested that there was a potential relationship between self-efficacy and mammography utilization. The KA women in the *American identity* group who perceived higher self-efficacy had the most recent mammograms while women in the *Marginality* group perceived lower self-efficacy and had the lowest rate of recent and regular mammograms. Therefore, self-efficacy might have been an important factor for KA women in the *American identity* group to receive a recent mammogram. This finding is consistent with a previous study that stated that self-efficacy was an important factor in influencing past mammography experiences and the intention to receive future mammograms among a convenience sample of 310 women aged 30 years and older in Korea (Ham, 2006). However, a contradicting result was presented in another study that perceived self-efficacy was not significantly associated with both recent and regular mammograms (Wu & Ronis, 2009).

Breast Cancer Knowledge and Mammography Utilization

KA women in both the *Bicultural* group and the *Korean identity* group have showed that they had better knowledge on the breast cancer curability although these two groups showed a contrast in mammogram status. KA women in the *Bicultural* group received a higher rate of regular mammograms while a high percentage of women in the *Korean identity* group have never had a mammogram. Therefore, the relationship between breast cancer knowledge level and mammogram status was not conclusive in this study. It is evident that having knowledge alone is not sufficient for KA women to receive a screening mammogram. Knowledge about breast cancer did not change the screening behaviors of KA women in the *Korean identity* group.

This finding is consistent with literature that stated that there was no relationship between knowledge about breast cancer and mammogram utilization. This previous study showed the same scores on the breast cancer knowledge scale between Korean women who have never had a mammogram and those who have ever had even one mammogram in the past (Lee et al., 2009).

However, in contrast to the results of this current study, it was reported that knowledge of mammography guidelines was the strongest independent variable that correlated with having regular mammograms. KA women who had knowledge about mammogram guidelines were 10 times more likely to receive regular mammograms (Juon et al., 2004). A similar finding was presented in another study that stated that KA women who did not have knowledge about mammograms were less likely to receive a mammogram in the past 2 years (Yu et al., 2003). Furthermore, having knowledge about breast cancer risks was significantly related to having a recent mammogram while having

knowledge of recommendations for frequency of mammography screening was strongly associated with a regular mammogram (Wu & Ronis, 2009). Therefore, future research should focus on fining out the specific knowledge deficit on either breast cancer risks or screening guidelines from each cultural group to promote better screening rate.

Effects of the Level of Acculturation on Mammography Utilization

This current study was interested in examining the relationship on how the different levels of acculturation might affect mammography utilization among KA women. The findings of this study supported a partial hypothesized relationship. A significant group difference was observed for regular mammogram utilization. KA women in the *Bicultural* group were significantly more likely to receive regular mammograms than women in the *Korean identity* group. This finding may support the findings of previous literature that stated that bicultural individuals who have a relationship with both an American society and a Korean ethnic society may have a better health status than an acculturation group assimilated into an American society or a traditional group segregated in a Korean ethnic society due to a more extended social support from both an ethnic and a host society (Lee et al., 2000). This finding is also in line with a previous study where Berry's four acculturation strategies were utilized that found that Korean Americans in an "integrated group" were found to have better physical and mental health (Jang et al., 2007).

There was no statistically significant group difference for getting a recent mammogram when compared with the *Korean identity* group. The potential problem of this result could be due to the disproportional sample size that might have led to a large variance in each group. Future study efforts should be directed to improve this limitation by recruiting study participants from different areas and settings.

Although the results of this logistic analysis did not demonstrate the effects of each acculturation level on mammography utilization, the different levels of acculturation have shown to be an important predictor for mammography utilization among KA women in this study. It was predicted that the *Bicultural* group will be more likely to receive a regular mammogram in the future.

Overall Demographic Variables and Mammogram Utilization

Additional logistic regression analyses were done to evaluate the potential relationship between the overall demographic characteristics of the participants and mammography utilization. Health insurance status was the only variable significantly related to receiving a recent mammogram in the last year. Participants who had private health insurance were two times more likely to receive a recent mammogram than women who did not have health insurance. This finding is similar to the result of a previous study that stated that KA women age 50 or older with private insurance were much more likely to have both a clinical breast exam and a mammogram in the past 2 years than those with public or no insurance (Lew et al., 2003). .

In contrast to this finding, it was reported that older KA women who received government insurance (Medicaid or Medicare) had a higher mammogram screening rate (Juon et al., 2002). Similarly, KA women who had any type of health insurance demonstrated a higher utilization of screening mammograms (Yu et al., 2003) and regular mammograms (Juon et al., 2004). Therefore, having health insurance is an important factor that determines getting a screening mammogram in most KA women regardless of the type of health insurance generally.

In this study, age was a significant factor to predict KA women receiving regular mammograms. This result is consistent with a previous study that stated that age was the only demographic variable that was significantly associated with mammogram utilization. In that study, women who had had a mammogram were significantly older than those who had never had one (Lee et al., 2009). Similar findings were also presented in another study that stated that KA women older than 50 years had received a higher percentage (79%) of screening mammograms than less than 50 year-old KA women (50%) in the past 2 years (Yu et al., 2003). It was found that Korean American women aged between 50 and 64 years were more likely to receive a mammogram than those aged 40 to 49 years according a study done by Choi et al., (2009).

Overall, health insurance coverage and age were identified as strong predictors for mammography utilization in this study. All other demographic variables were not significant factors for screening mammography behaviors of KA women in this study.

Summary

Among health beliefs, the perceived barriers were the most significant factor for receiving a mammogram among participants in this study. Regarding self-efficacy, KA women in the *American identity* group felt most confident in her ability to get a screening mammogram. For breast cancer knowledge, no relationship was identified between the knowledge level and mammography utilization. The *American identity* group received the most recent mammogram rate while the *Marginality* group had the lowest number of participants who had received a mammogram in the past year. The *Bicultural* group received the most regular mammograms while the *Korean identity* group had the lowest regular mammogram rate for the past 5 years. It was also found that the *Bicultural* group

was significantly more likely to receive regular mammograms in the future when compared with the *Korean identity* group.

The findings of this study showed that there is a relationship between acculturation and mammography utilization. The more acculturated KA women who belonged to the *American identity* group had the highest recent mammogram rate. KA women in the *Bicultural* group had the highest rate of regular mammography utilization and they were also more likely to receive future mammograms regularly. Therefore, it was concluded that acculturation was an important predictor for mammography utilization among KA women in this study.

Limitations and Strengths

There were several limitations to this study. First, the findings of this study cannot be generalized to the entire KA women population in the United States. This study utilized a convenience sample of KA women living in the Los Angeles County, exclusively the "*Koreatown*" area; therefore, the sample included a higher percentage of KA women who maintained strong ties to Korean culture by staying out of the mainstream of American life. In the future, efforts to recruit a culturally diverse sample of KA women utilizing more systematic and structured sampling methods in different residential areas are warranted to strengthen the study.

Second, the mammography status was measured by the participants' self-reports. Although the self-reporting method has been found to have reasonable accuracy and validity, there are still potential limitations to this method, especially, among KA women. Besides their recall bias, their cultural tendencies toward downplaying their opinions and the desire to please others may have influenced results. These cultural features might lead

KA women to over report on their past mammogram screening history to please the research staff (Caplan et al., 2003).

Third, another limitation of this study was the lack of sample size equivalence. As expected, this study did not achieve the four equally divided cultural groups because participants of a convenience sample belonged more to one group than the others. In addition, research participants could belong to two or more acculturation groups according to the VIA instrument which explains that these four acculturation strategies are not mutually exclusive (Rudmin, 2003).

Lastly, the use of cross-sectional data was another potential limitation. Participants' responses could have been influenced by individuals' emotions at that moment and may not reflect their overall opinions and beliefs. Some of the participants were simply rushing through to complete the questionnaires. A more structured one-on-one interview data collection method would be ideal to minimize this limitation in the future.

Despite these limitations, this study was the first study to measure the levels of acculturation by utilizing a bidimensional acculturation scale in an attempt to increase the understanding of the relationship between acculturation and breast cancer screening behaviors of KA women. Therefore, the findings of this study addressed the gap in the current literature and provided information to design acculturation-tailored interventions to promote breast cancer screening behaviors of KA women. An additional strength of this study was that the participants' mammogram status was measured following American Cancer Society recommendations focusing on both recent and regular mammograms.

Implications for Future Nursing

This study presents several important implications for future nursing research to promote breast cancer screening behaviors of KA women. Overall, the findings of this study underscore the importance of acculturation effects on mammography utilization among KA women.

Future Clinical Practice

Generally, KA women who used *assimilation* or *integration* strategies reported having more recent and regular mammograms. On the other hand, KA women who utilized *separation* and *marginalization* strategies have shown to have low utilization of screening mammograms. Therefore, it is important to develop intervention programs specifically targeting less acculturated KA women to promote their breast cancer screening behaviors. More effective community programs are required to reach these KA women whose cultural identities belonged to the *Korean identity* and *Marginality* groups.

Overall, implementation of culturally appropriate educational interventions is also needed to increase general breast cancer knowledge and confidence of getting screening mammograms among KA women. Educational materials need to be designed towards helping women who are less fluent in English from the *Korean identity* and *Marginality* groups. In addition, providing information regarding free-community programs and financial assistance will be helpful for KA women in these groups because a high percentage of them have no health insurance coverage.

The findings of this study shed light on what health care professionals have missed and what they should consider in caring for culturally diverse populations. No previous study has examined the relationship between the level of acculturation and

mammography utilization in KA women specifically. Not only does this study expand the knowledge of acculturation on breast cancer behaviors of KA women, but the findings of this study will also provide a rationale for the development of acculturation level-tailored interventions to promote breast cancer behaviors. Furthermore, the educational program regarding breast cancer screening for KA women should aim not only to increase their knowledge but also to restructure their existing knowledge with carefully selected culturally-sensitive languages. Clinicians should be highly aware of uniqueness of belief and perception of KA women toward the screening practice to develop more culturally adaptable interventions to increase their breast cancer screening rate (Lee et al, 2007).

Future Nursing Research

Acculturation has been found to be directly influential to the health behaviors of immigrants (McDermott-Levy, 2009). Therefore, the importance of research on acculturation has become pronounced as cultural diversity has increased with the growing number of immigrant populations in the United States. Future research should expand and focus on more carefully examining the barriers and the unique needs of each level of acculturation and determining which factors of acculturation are relevant in developing the acculturation level-specific interventions (Jang et al., 2007). Specifically, identifying each individual's barriers of getting a mammogram and suggesting possible solutions would be crucial for KA women in the *Marginality* group who perceived the most barriers to increase their mammogram utilization.

Furthermore, the findings of this research may also provide a guide in developing an acculturation scale because there is no instrument developed specifically for Korean Americans at present. The instrument should also measure psychological and emotional

contexts of acculturation faced by Korean Americans. In the future, a new theory of acculturation in the nursing discipline will also be needed to predict and explicate the health behaviors of immigrants, since acculturation continues to be an important variable in the health behaviors of these populations.

Conclusion

Korean Americans represent the seventh largest immigrant group in the United States; however, they are regarded as an underserved population when considering health research, services, and policies (Jo et al., 2010). According to the California Health Interview Survey (2007), a larger proportion of Korean Americans are uninsured when compared with other Asian American groups in California. In addition, Korean Americans experience many difficulties and suffer from health disparities while acquiring proper health services under the current U.S. health care system.

More importantly, Korean American (KA) women suffer from the threat of breast cancer, which is the most common cancer diagnosis. Incidence of breast cancer among KA women increases with the duration of their U.S. residency. However, KA women's breast cancer screening rates mark as the lowest. Numerous studies have identified the predictors and barriers regarding KA women's breast cancer screening practices. Many of them were socioeconomic and psychological factors that may influence breast cancer screening, but the effects of acculturation on the breast cancer screening behaviors of KA women are not clearly known. Furthermore, many previous intervention studies have shown to be ineffective in promoting breast cancer screening behaviors. None of the previous studies have examined the relationship between the level of acculturation and mammography utilization among KA women specifically.

KA women utilized the four different acculturation strategies defined by Berry (1997) and exhibited four different levels of acculturation. It was found that differences exist in perceived health beliefs, self-efficacy, knowledge levels, and mammography status among these four different levels of acculturation. Therefore, it was concluded that acculturation was an important predictor for mammography utilization by KA women in this study.

Recognizing the unique determinants of health behaviors of KA women from each level of acculturation and developing culturally appropriate interventions with a specific emphasis on targeting these different acculturation levels would be an important factor for increasing breast cancer screening practices among these women. Ultimately, regular utilization of mammography by KA women will enhance early diagnosis and early treatment, and decrease mortality rate, further increasing the quality of life of this population.

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