AN ABSTRACT OF THE DISSERTATION OF

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The purpose of this study was to describe Iranian immigrant women's knowledge, beliefs and attitudes towards breast cancer, and their breast cancer screening behaviors. Specifically, this research examined the predictors of age-specific breast cancer screening participation among this population. The participants in this study consisted (n=341) of self-identified first generation immigrant Iranian women who were born and/or lived in Iran before they migrated to the United States and were recruited through a snowball sampling technique. The inclusion criteria for the participants were: a) women between the ages of 30-80 years who lived in California, b) women were able to read and speak English and /or Persian. Survey data was entered using SPSS, and was analyzed using descriptive univariate frequencies and bivariate cross tabulations. The Chi square statistic was used to

test the significance of bivariate cross-tabulations at α=.05. Secondly, Logistic regression was used to identify predictors of women's breast cancer screening. Logistic regression using the method of likelihood estimation was conducted to identify the most important predictors after adjusting for other variables (P>.05 for removal from model). The logistic regression results appear as odds ratios (ORs) and 95% confidence intervals. In general screening rates for CBE and mammography among the participants in the current study were higher than levels set in the year 2010 Health Objectives and those reported for women nationally. These findings are inconsistent with previous studies on immigrant women living in the United States which indicate low rates of screening compared with the predominantly white populations and even lower rates of screening among first generation immigrants. The comparatively lower BSE compliance rates are in contrast with the higher annual age specific CBE and mammography rates. However, the low rate of BSE practice is consistent with previous findings from other studies on immigrant women's screening behaviors. Research regarding breast cancer screening behaviors of Middle Eastern women remains very limited and studies about breast cancer screening behaviors of Iranian immigrant women are non-existent. This study was the first attempt to address this research gap and provide a preliminary

understanding of the health practices in this understudied ethnic group. This information will in turn provide suggestions for more focused ethnic specific health promotion programs to increase breast cancer screening behavior among this population.

Breast Cancer Screening Behaviors Among Immigrant Iranian Women in the United States

by

Mehra Shirazi

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CHAPTER 1

INTRODUCTION

Breast cancer is the second leading cause of cancer death in women, exceeded only by lung cancer. According to the American Cancer Society (ACS) in 2004, approximately 215,990 and in 2005, 211,240 women in the United States will be diagnosed with invasive breast cancer (ACS, 2005). It is estimated that 40,410 women will die from breast cancer in the United States this year (ACS,2005). This translates into approximately 1 in 8.2 women that will receive a diagnosis of breast cancer in her lifetime, and 1 in 30 will die of the disease (ACS, 2005). Breast cancer incidence increases with age, and although significant progress has been made in identifying risk factors and genetic markers, more than 50% of cases occur in women without known major predictors (ACS, 2004). Early detection can identify breast abnormalities that may be cancer at an early stage. Numerous studies have shown that early detection saves lives and increases treatment options. The ACS guidelines for breast cancer screening were last revised in 1997. The ACS currently recommends that women begin monthly

breast self-examination (BSE) at age 20, between age 20-39 women should have a clinical breast examination (CBE) by a health care professional every three years; and beginning at age 40 women should have an annual mammogram and CBE (ACS, 2003). In 2002, the United States Preventive Services Task Force (USPSTF) updated their breast cancer screening guidelines to recommend that women aged 40 years and older should receive mammography every one to two years with or without clinical breast examination. In spite of the advances in technology to improve early diagnosis and an increased emphasis on education to promote awareness of early detection, 46,000 women die annually. A significant number of these losses could be prevented through risk reduction measures, yet many women do not practice breast self-exam (BSE) or receive adequate clinical screening.

Although there has been an increase in the utilization of breast cancer screening, particularly in the White, middle and upper socioeconomic classes, there is considerable disparity in screening rates crossing all demographic sectors. A study conducted by the board of sponsors for the National Breast Cancer Awareness Month (NBCAM) found a growing trend among minorities and the elderly women showing they are far less likely to

have regular screening (NBCAM, 2001). Research has repeatedly shown that minority women in US have more advanced stages of breast cancer (lower breast cancer screening rates) and lower survival rates (higher mortality rates) than white women, despite the fact that white women have a higher incidence of breast cancer (Fox, 1994; Zavertnik, 1993; Bain et al., 1986). Researchers have found that among minority women a variety of factors such as socio-cultural and economic barriers, including education, culture, income and age contribute to the under use of screening methods (Fox, 1994; Zavertnik, 1993; Bain et al., 1986).

With the arrival and rapid growth of new immigrant groups U.S is experiencing dramatic changes in the ethnic mix of their populations. Within each of the broad ethnic categories are diverse cultural and socioeconomic groups. Limited information is available about the health status and health practices within these groups and the degree to which these groups are assimilating and using the information provided in health education is also poorly understood (Hoare et al.,1994).

One challenge for the 21st century is to meet Healthy People 2010's goals of increasing early detection of breast and cervical cancer, and reducing breast and cervical cancer mortality among

multicultural and racial and ethnic minority women in United States (United States Department of health and Human Service : Healthy People 2010).

The projected growth in the racial and ethnic population, in addition to the racial disparities in cancer survival rates, highlight the need to examine the breast cancer profiles and factors that influence early breast cancer screening and early detection behaviors of the racial and ethnic groups'. Equally important is an understanding of these groups acceptance of those behavioral recommendations.

Little research is available about the early breast cancer screening behaviors of Middle Eastern immigrant women in U.S and there are no published studies on the breast cancer screening behaviors of Iranian immigrant women. Therefore, in order to provide an understanding of the factors related to Iranian immigrant women's breast care behaviors this study will examine breast cancer knowledge, beliefs and breast cancer screening behaviors including ; breast self-examination, clinical breast examination, and mammography of immigrant Iranian women aged 30 and up living in California.

Breast cancer is the second major cause of cancer deaths in the United States (ACS, 2005). Research indicates that women from racial and ethnic minority groups report lower breast cancer rates and higher breast cancer mortality rates than their white counterparts. Screening methods and programs are critical strategies for the early detection and timely treatment of breast cancer. In order to improve breast and cancer screening and early detection outcomes of racial and ethnic minority women the vast inter-group variations among these women should be considered so that a "one size fits all" approach is avoided. Research regarding breast cancer screening behaviors of Middle Eastern women remains limited and studies about breast cancer screening behaviors of Iranian immigrant women are non-existent. This supports the need to investigate screening behaviors that may be specific to the Iranian immigrant women because it is unique and different from ethnic groups and cultures that have been previously studied.

The purpose of this study is to collect information about prevalence of early breast cancer detection behaviors among a population of Iranian immigrant women in California. Specifically,

this study will examine the relationship between the health belief model (HBM), knowledge related to breast cancer screening, health-professional recommendation, selected demographic variables, acculturation and compliance with recommended early breast cancer detection guidelines. The goal is to provide a preliminary understanding of the health practices in this ethnic group. This information will in turn provide suggestions for more focused ethnic specific health promotion programs. This study is significant for several reasons: 1. No studies previously have studied breast cancer screening behavior among immigrant Iranian women in United States. 2. Attitudes and beliefs of Iranian immigrant women regarding breast cancer screening behavior may be different from other culture/ethnic groups that have been studied previously. 3. Findings from this study will contribute to the body of knowledge needed to formulate culturally sensitive health promotion programs to increase breast cancer screening behavior among this population.

Research Questions

The following research questions guided this study: 1. Is there a relationship between the level of acculturation of immigrant Iranian women and their compliance with age-specific breast cancer detection guidelines for BSE, CBE, and mammography?

2. Is there a relationship between the health beliefs of immigrant Iranian women and their compliance with age-specific breast cancer detection guidelines for BSE, CBE, and mammography?

3. Is there a relationship between Iranian immigrant women's selected socio-demographic variables (age, education, employment, income, access, and social support) and compliance with age-specific breast cancer screening guidelines for BSE, CBE, and mammography?

4. Is there a relationship between breast cancer knowledge and compliance with age-specific breast cancer screening guidelines for guidelines for BSE, CBE, and mammography ?

5. Is there a relationship between health-professional recommendation and compliance with early breast cancer screening guidelines for BSE, CBE, and mammography?

Hypotheses To Be Tested

1. There is a significant positive relationship between the level of acculturation and compliance with age-specific breast cancer detection guidelines for, BSE, CBE, and mammography among immigrant Iranian women living in California.

2. There is a significant relationship between health beliefs about breast cancer and compliance with age-specific breast cancer detection guidelines for, BSE, CBE, and mammography.

H2a. Perceived seriousness, perceived benefits, perceived barriers, self efficacy and motivation are significantly related to compliance with early breast cancer detection guidelines for breast self-examination.

H2b. Perceived seriousness, perceived benefits, perceived barriers, self efficacy and motivation are significantly related to compliance with early breast cancer detection guidelines for clinical breast examination.

H2c. Perceived seriousness, perceived benefits, perceived barriers, self efficacy and motivation are significantly related to compliance with early breast cancer detection guidelines for mammography.

3. There is a significant relationship between Iranian immigrant women's selected socio-demographic variables (age, education, employment, income, access, and social support) and compliance with age-specific breast cancer screening guidelines for BSE, CBE, and mammography.

4. There is a significant positive relationship between breast cancer knowledge and compliance with age-specific breast cancer screening guidelines for, BSE, CBE, and mammography.
5. There is a significant positive relationship between health professional recommendation and age-specific compliance with breast cancer screening guidelines for, BSE, CBE, and mammography.

The following limitations were identified for this study:

1. The research findings may not be generalizable to a larger population due to the characters of the sample as being non-random.
2. The results of the study are limited to the ability of the subjects to recall past behavior.

CHAPTER 2

LITERATURE REVIEW

This chapter provides a review of literature in five significant areas which are vital to this study. These are breast cancer and ethnicity, acculturation and immigration, Iranians in the United State, breast cancer screening among immigrant women, breast cancer knowledge, social support, and health beliefs.

Breast cancer and Ethnicity

American Cancer Society (ACS) estimates that in 2004, approximately 215,990 and in 2005, 211,240 women in the United States are diagnosed with invasive breast cancer (ACS, 2005). It is also estimated that 40,410 women will die from breast cancer in the United States this year (ACS,2005). This translates into approximately 1 in 8.2 women that will receive a diagnosis of breast cancer in her lifetime, and 1 in 30 will die of the disease (ACS, 2005).According to the National Cancer Institute the age adjusted incident rates for invasive female breast cancer between 1996-2000 were highest among white women followed by black women followed by Asian/pacific Islanders and Latinas. Mortality rates also vary among racial and ethnic groups. Breast cancer

mortality rates between 1996-2000 were highest among black women followed by white and Latina women, American Indian/Alaskan natives and Asian/Pacific Islanders. Results from different studies indicate that lower SES, black race or Hispanic ethnicity, younger age, and later year of diagnosis are some of the risk factors for late stage diagnosis and long duration of symptoms (Chen et al., 1994).

Caplan and collegues (2000), examined time to diagnosis and treatment for medically underserved women. They found that black and Hispanic women had the longest diagnostic interval (more than 30 days) as compared to white women (15 days). This finding implies that African American women and Hispanic women have the longest time between the inset of disease and diagnosis. Lanin and collegues (1998), assessed the influence of SES and cultural factors on racial differences in breast cancer stage at diagnosis. Demographic and SES factors that were significant predictors of advanced stage were: being a African American, never married, having low-income, no health insurance, delaying seeing a physician due to lack of resources, and lack of transportation.

In 1988 a survey of 282 Chinatown households found that 74% of the Chinese women aged 40 and older had never had a mammogram, and 45% of the women 18 years and older never had

a Pap smear (Lee et al., 1996). Miller et al., (1996) reports that among Asian/Pacific Islander women diagnosed with breast cancer in the United States, 20% of Chinese women, 16% of Filipino women, and 15% of Japanese women will die from it.

Previous studies have also found that the risk of breast cancer increases with age (Harris et al., 1991). Older women in particular do not believe they are likely to get cancer as younger women do or do not know they need screening (Champion, 1992). An examination of age differences in breast cancer early-detection behavior in a multiethnic sample of low-income women showed no significance difference in breast cancer knowledge or perceptions of personal risk of breast cancer (Freidman, et al., 1998). This indicates that women across all age groups were similar in their perceptions of personal risk and that older women may not be assessing their increased risk accurately and therefore underutilizing screening procedures. In an interview of 197 African -American women, Tessaro and Smith (1994), found that subjects viewed family history and not age as a significant risk factor. These women were more concerned about other chronic diseases such as hypertension diabetes and arthritis than about breast cancer. At the same time, data suggested that if the health care providers informed women of their personal cancer risk and recommended screening greater compliance with guidelines would occur.

In addition to lack of knowledge, other barriers to regular cancer screening for minority women have been suggested. These include fear, and reluctance to discuss breast cancer. According to Phipps et al., (1999) , Cambodian American women still hold misconceptions regarding etiology of breast cancer and fatalistic perspectives regarding outcomes due to lack of frequent discussions within their community. Morrison (1996) has also concluded that exposure to early breast cancer screening detection messages from a clinician is a significant variable predictive of screening behavior in older minority women. Yet older women are significantly less likely to have received routine BSE instruction from a health care provider or to perform BSE (Morrison, 1996; Champion, 1992).

A study by Yu et al., (2003) investigated factors influencing breast cancer screening utilization by Chinese and Korean women, living in the United States, and examined similarities and differences between the two sub-populations. The results indicated that women's mammography use was significantly associated with their ability to speak English, availability of health insurance, and knowledge of mammography.

Another study explored the reasons why Mexican and Dominican women from medically underserved communities in New York City do not seek breast cancer screening. The three most

commonly cited barriers were not taking care of oneself, lack of information, and fear. Women who had been screened before cited fear, pain, or other personal barriers more often, but women who had never had a mammogram cited cost or other logistical barriers. Responses from Dominican and Mexican women were significantly different, with Mexican women more often citing shame or embarrassment and Dominican women more often citing fear. The results indicated that it may not be sufficient merely to increase access to breast cancer screening services for low-income Latinas and even when women have a source of health care, personal barriers may prevent many women from seeking screening. The results also point out that outreach programs need to be tailored to the target communities as there are significant differences among groups of Latinas. It is also central that targeted outreach programs work in tandem with other programs to increase access to ensure that both personal and logistical barriers to screening are addressed (Garbers et al., 2003).

Theories and Models of Acculturation

All immigrants despite their gender or race or reasons for immigration, experience acculturation (Tohidi, 1993).Acculturation has been defined as the process where a person accumulates and incorporates the beliefs and customs of an alternate culture (Mendoza & Marinez, 1981).

Acculturation is also considered a multidimensional process involving changes in behavior, values, beliefs and attitudes resulting from contact and/or collision of home and host culture. Acculturation takes place when individuals from different cultures come into contact with each other, it is considered a multi-dimensional process (Ghaffarian, 1998).

The acculturating process begins as a result of contact and interaction between two or more cultural groups. Berry (1980) defined acculturation as a dynamic process with three phases that exist in a continuum, not independently. First, contact with the new culture, then conflict when the value system of the individual clashes with the main stream culture and eventually adaptation. The process of individual acculturation involves the adaptation of the person's customs, habits, language life-style and value orientations.

In the adjustment model the individual tries to be more like the people of the host culture, in order to reduce the experience of conflict. In the reaction model the individual goes against the host culture gets involved in with organizations of his/her own country. In the withdrawal model contact with the host culture is minimized and could lead to feelings of rejection of the mainstream culture. In the deculturation model, the individual may develop feelings of loss of identity, rejection or alienation (Berry, 1980).

Several models have been developed for the direction and dimensions of change caused by acculturation. The first model posits that the phenomena occur in both directions. Keefe (1980) takes the position that cultural change may occur in one or both groups and in various aspects of culture, and the stronger direction of influence is from the dominant culture to the non-dominant group. This process is referred to as assimilation. In order for this process to take place the non-dominant group has to be accepted by the dominant group.

Another model combines the elements of the other two models (Padilla, 1980). This model challenges the idea that change occurs in a unidirectional continuum resulting in the replacement of one culture by another. It also challenges the assumptions that the traditional or non-dominant culture is either maintained or lost by its contact with, and possible assimilation into the host culture. Padilla proposes that the interplay of culture multidimensional, indicating that awareness and loyalty to the original culture can be kept even though assimilation is recognized in behaviors and attitudes of the individual.

Many early works on acculturation assume that all immigrants eventually abandon their own culture and assimilate unidirectly into the Anglo-American culture. However , contrary to the melting pot theory, immigrants often retain many aspects of

their own culture and even some ethnic groups never completely assimilate into mainstream society. In addition great majority of studies have considered immigrants only with respect to how "Americanized" they are and have overlooked the other important aspect of their identity of how "ethnic" they are.

The concept of pluralism emphasizes culture rather than nationality as the primary focus of identity and promotes the maintenance of original cultural identity while investing in the goals of the larger group. This approach recognizes that the classification of the individuals with respect to the American culture is insufficient and a more appropriate approach would conceptualize the individual along two separate continua . One is the degree to which the person identifies with the host culture and another the degree to which the person identifies with the home culture (Mendoza, 1989).

Development of measurements of acculturation often varies between researchers. The process has progressed from assessment by a single index such as language to several socio-cultural and semantic differential indices that include concepts such as cultural identity or loyalty (Berry, 1980). In reviewing various methods that have been used Mendoza and Martinez point out that acculturation has been measured by using conformity scales, language usage, knowledge of idioms, semantic meaning, and cognitive styles.

In summary the literature indicates that the effects of culture occur through processes of change and adaptation when multiple groups interact. In a model of selective acculturation the ethnic group chooses to make changes in their personal or cultural patterns in order to be accepted or belong to the host society and retains others reflecting the multifaceted process of adaptation to a new environment. The concept of acculturation is a two way flow of cultural elements (Berry, 1980). Thus acculturation is a process that is both culture producing and culture receiving.

The study of acculturation by health researchers in the US has focused almost exclusively on four major ethnic minority groups: African Americans, Asian Americans, Native Americans and Hispanics/Latinos (Chun et al., 2003). Some researcher have critiqued the use of the acculturation construct in health research. Critics of acculturation research have long pointed out that, due to a lack of clear definitions and insufficient conceptualization of acculturation, its central concepts remain implicit, poorly stated, simple, ambiguous, and inconsistent (Rogler et al., 1991; Arcia, Skinner, Bailey, & Correa, 2001; Ponce & Comer, 2003; Salant & Lauderdale, 2003; Rudmin, 2003).

In review of 69 Hispanic acculturation articles, Hunt and colleagues (2004), found that 66% included no definition of

acculturation at all. The ones that did define acculturation were consistently vague definitions. They argue that all definitions of acculturation encountered refer to a process of cultural change resulting from contact between two cultures.

The acculturation models speculates the existence of two different, identifiable cultural scales : the ethnic versus the mainstream, and attempts to place the acculturating individual on a continuum between them. However, there are no clear definition for "culture" in each different context.

Hunt and collegues (2004), argue another limitation of acculturation studies is their disregard for the impact of socio-economic factors. They point out that these articles tend to "separate culture from the larger social structure and the dynamic social processes in which behavior and beliefs are generated". They note that most often socio-economic challenges associated with immigration, poor English language skills, and poverty, are treated separately or as confounding variables. At the same time, critical discussion about acculturation in the health literature has concentrated almost entirely on issues of psychometric modeling and principles of measurement, while neglecting the central question of what is being measured. They conclude in the absence of a clear definition and an appropriate historical and socio-economic context, the concept of acculturation has come to function as "an ideologically convenient black box",

wherein problems of unequal access to health , such as insurance, transportation, education, and language, are pushed from the forefront, and ethnic culture is made accountable for health inequalities.

Migration

As stated previously following migration to a new culture immigrants are faced with an unavoidable collision of the home and host culture. Past life experiences of and the circumstances under which people migrate vary greatly and hold significant implications for adjustment to life in the host culture (Ben-Porath, 1991).

Traditional theories of migration present that refugees migrate because of "push" factors in their home country and immigrants migrate because of "pull" factors in the host country (Boyd, 1989). More recent migration theories argue that the reasons for migration is more complex than the push versus the pull theory. For example family networks are important factors for both refugees and immigrants in the decision to migrate (Boyd, 1989).

Cassel and Tyroler who studied migrants to an industrial milieu in north Carolina explored the hypothesis that change to an industrial setting from a predominantly agricultural employment milieu would create stressors that could impact on psychological, somatic and social health. They argued that mental and physical health problems could originate from incongruities between the

culture of the migrant and the host social situation (Cassel and Tyroler, 1961). These problems would arise from excess adjustment burdens and from personality system of the individual migrants. Cassel (1976) elaborated on the stress process and proposed that a wide variety of health conditions and consequences might be associated with changes in the social environment. Pearlin et al., (1981) developed a path analytical model of social stress, "in which the process of stress as combining three major conceptual dimensions; the sources of stress the mediators of stress and the manifestations of stress." (P.337). Hypothesized sources of stress include stressful life events. Migration is a major life event and this migration from one geographic region of the world to another maybe conceptualized as a source of stress that impacts physical and mental health.

International migration even under ideal circumstances is stressful and requires accommodation, adaptation, or coping (Dyal & Dyal, 1981). The process of migration and resettlement requires many psychological adaptations that have been described as loss experiences, disruption of one's familiar routine possible accommodations to a new language as well as adjustment to a new occupation, and subordination (Reed, et al., 1970). Those who immigrate into a new culture are faced with social and

psychological conflicts related to the differences of normal and values of the host culture.

In an inquiry into the experience of chronic illness by immigrant women, Anderson (1985), examined the context in which women's experiences are embedded. She argues that multiple factors influence the ability to manage illness. Among them are the emotions that are an integral part of daily existence, and the sense of self that is constructed during the course of a chronic illness. She adds, for the immigrant woman difficulties of living with a chronic illness are exacerbated by the experience of uprooting from her homeland and finding a home in a new country. Immigrant women must deal with her marginality, social isolation and alienation in a new country. Therefore, the feelings of being devalued is not only from the experiences of the chronic illness but also from the definition of self that is constructed in dealing with the migration experience (Anderson, 1985).

The acculturative stress that immigrants face can be a result of the significant differences among two cultures. It has also been reported that the greater difference between the host culture and the immigrant's culture , the more difficult it is to adjust (Taft, 1977). Research on immigrants from more traditional cultures such as Cubans, Mexicans and Asians show that these immigrants tend to face problems and difficulties during the acculturation process.

Those who feel marginalized tend to be highly stressed, and assimilation leads to intermediate levels of stress. Studies conducted on immigrant women coming from more traditional cultures (Hispanic, Middle eastern) have indicated that one of the most conflictual aspects of acculturation for women is changes in gender role (Melesis, 1991).

To understand the influence of "a culture" on individual or group behavior requires knowledge and understanding of how that culture operates in the context of its relationship with other cultures. Studies of the influence of cultural factors on behavior have noted that the behaviors of individuals not only are influenced by the culture in which they develop (enculturation) but also by other cultures that act upon them (Berry, 1993). Therefore both acculturation and enculturation determine a person's cognition, attitudes and behavior. For this reason Berry emphasizes the need to focus on attention at the contact group level (family, neighborhood) when studying behavioral change and cultural influences.

Many studies investigating the relationship between acculturation, as a unidimensional construct , and cancer screening behaviors fail to statistically control for the effects of other sociodemographic factors (age, sex, marital status, race, income, education, health coverage, etc) Two studies (Elder et al.,

1991;and Marks et al., 1987) have examined the effects of acculturation on Pap smear and mammography screening with consideration of sociodemographic variables. It is important to avoid investigating acculturation and socioeconomic factors apart from each other when attempting to understand breast cancer screening behaviors. Socioeconomic status seem to constitute an important influence on how women perceive breast cancer. For, example higher levels of education, income, health insurance, and access to health care help reduce the feelings of powerlessness, denial, and turmoil (Saint-Germain and Longman, 1993). Many barriers to breast cancer screening are related to income, education, immigration status, and language barriers rather than result of cultural beliefs and behaviors. Navon (1999), stresses the inadequacy of attributing each and every difference to cultural factors when in fact they may be due to economic or educational disparities.

Immigration and social discrimination are believed to account for much of the differences in cancer screening behavior (O'Malley et al., 1997). Rajaram and Rashidi (1998), point out that the history of institutional racism in America predicates that expectations of prejudicial treatment often will be part of a community network database relevant to health related decisions.

In an article that looks at gender, poverty and health Anderson (2000), points out that in order to construct knowledge for practice and praxis, research agendas of the future should be inclusive of subaltern voices. This would mean making space for critical examination of multiple voices from different socio-historical perspectives. She argues that by making space for the analysis of the processes that have structured our world we will be able to unmask the unequal relations of power and issues of domination and subordination, based on assumptions about race, gender and class relations. As it is now understood colonialism, and neo-colonialism, racism, marginalization, and gender and class intersections all impact human suffering and health. She point out that understanding of cultural identity should be within a socially constructed, historical, gendered, "raced", and political context.

Anderson (2000), suggests that in order to conduct research that is applicable to all people, we must strive for an inclusive approach. An inclusive approach does not only indicate including people of color as participants in research projects but also involving women of color whose voices have been silenced in the social production of knowledge that reflects their socio-historical perspective.

Iran: Culture and Language

Iran is located in the Middle East. With an area of 1.6 million square km. (636,294 square mi.) and a population of more than 60 million , it is one of the largest most populated countries in the region. There are different ethnic groups in Iran. The dominant nationalities are Persian; Azeri Turks; Kurds; Arabs; Turkomans and Baluchis; and Lur, Bakhtiari, Qashqai tribes, Armenians, Jews, and Assyrians. Almost two-thirds of Iran's people are of Aryan origin. Their ancestors migrated from Central Asia. The major groups in this category include Persians, Kurds, Lurs, and Baluchi. The remainder are primarily Turkic but also include Arabs, Armenians, Jews, and Assyrians.

The official language of Iran is Farsi . It is the language of government and public instruction and is the mother tongue of half of the population. Farsi is spoken as a second language by a large proportion of the rest. Many different dialects of Farsi are spoken in various parts of the country.

As part of the Indo-European family of languages, Farsi is distantly related to Latin, Greek, the Slavic and Teutonic languages, and English. Farsi is the most important of a group of several related languages that linguists classify as Indo-Iranian. Farsi speakers regard their language as extremely beautiful, and they take great pleasure in listening to the verses of medieval poets such

as Ferdowsi, Hafez, and Sadi. The language is a living link with the past and has been important in binding the nation together.

Most Iranians are Muslims; 95% belong to the Shi'a branch of Islam, the official state religion, and about 4% belong to the Sunni branch, which predominates in neighboring Muslim countries. Non-Muslim minorities include Zoroastrians, Jews, Baha'is, and Christians.

Iranian Immigrants

Three waves of Iranian immigration to United States have been described. The first wave begins after World War II until 1970 and consisted mostly of students from social elite and stayed in the United States. The second wave (1970-1978) was more varied in social class and these immigrants mainly came for educational and economical opportunities. The third wave (1978) began after the political turmoil in Iran which began in 1978 and ended a year later with the demise of the Pahlavi dynasty. This wave includes a large number of political exiles and forced migrants who came mainly for economic or personal security.

The US census estimates that Iranian American community numbers around 330,000, with the largest community of Iranian descent residing in California. However, according to research by the Iranian Studies Group, at Massachusetts Institute of Technology (MIT) Iranian-Americans are far more numerous in the

United States than census data indicate. There are estimates that the actual number of Iranian-Americans may top 691,000 to 1,000,000 (Fost, 1990; ISG MIT, 2003). California is one of the most attractive locations for Iranian immigrants with Los Angeles being the largest Iranian community outside of Iran. The central component of Iranian communities in the United States include both formal cultural organizations, that coordinate holiday and religious events, sponsor film festivals, and publish newsletters and more informal resource centers such as bookstores, markets and restaurants.

There has been little research on the health of this population except for clinical descriptions,and mental health topics such as depression, grief and marital satisfaction.

Jalali (1982) has pointed out the many differences between the Iranian culture and the United States. For example the traditional family system in Iran is patriarchal and roles are clearly defined in terms of expected behaviors, with the men holding the dominant and powerful positions within the family. Women tend to play a more indirect role in the decision making process.

Jalali (1982) points out that from an early age, boys are socialized to be dominant and independent while girls are taught to be submissive and subordinate to males. Iranians tend to be more family oriented and for the Iranian individual, extended family

including grandparents, aunts, uncles and cousins function as an available support system.

Only a limited number of studies have investigated the acculturation of the Iranian immigrants in the United states. Ghaffarian (1998) looked at the difference between the rates of acculturation of immigrant men and women living in United States. The relationship of acculturation and traditional family values was also investigated. Results of her study indicated that overall Iranian men were more acculturated than Iranian women. But men held more traditional values regarding gender roles. Women on the other hand held more "modern" views regarding attitudes toward the role of women. This findings were attributed to the fact that Iranian women through the process of acculturation were more reactive to egalitarian values and attitudes with regard to gender role.

In a survey of Iranian immigrant women in United States Tohidi (1993) states, "Changes in traditional conceptions of womanhood, manhood, and marriage from an autocratic male dominated model to a more egalitarian one are taking place faster among Iranian women than Iranian men" (P.3). This means that one of the main effects of acculturation on Iranian women are changes in gender roles.

In summary research has demonstrated that, migration has meant a breakdown of traditional norms for Iranian women. While

Iranian immigrant women are moving away from traditional understandings of gender roles and sexuality, they are developing their own unique combination of qualities and values representing the cultural dimensions of both their past and present.

Breast Cancer in Iran

Although no studies exist on the breast cancer screening behaviors of Iranian immigrant women in the United States, some recent studies conducted in Iran explored the risk factors associated with breast cancer among Iranian women. A case–control study was conducted from April 1997 to April 1998 in Tehran, Iran. The cases were, newly diagnosed breast cancer patients living in Tehran and they were entered into the study if they had a confirmed pathological breast cancer diagnosis and were admitted to a Hospital for breast surgery. The control women were recruited from female patients living in Tehran without any history of breast problems or neoplastic disease admitted to the same hospital for a wide spectrum of general surgical procedures. The findings suggested that Breast cancer patients in Iran are relatively young, and that marital status and a positive family history of breast cancer are risk factors for breast cancer in Iran. This is in accordance with other research findings indicating that a positive family history is a risk factor for breast cancer. However it was argued that the relatively high proportion of young breast

cancer cases in Iran is most likely due a to a young population structure and to a nation of high age at menarche and low age at first pregnancy, which are protective in later life. The findings presented here show that never married women were at higher risk for breast cancer. Although the results cannot be generalized, the findings suggest that the associations between some known risk factors for breast cancer may differ in Iran as compared with Western countries, and that familial breast cancer in young Iranian breast cancer patients needs further investigations (Ebrahimi et al., 2002).

A prospective study measured anxiety and depression in Iranian breast cancer patients before and after diagnosis using the Hospital Anxiety and Depression Scale (HADS). The results showed that patients with advanced disease and a lower performance status were more anxious and experienced more depression. These findings suggest that severe symptoms of anxiety are the most frequent symptoms in Iranian breast cancer patients (Montazeri et al., 2000)

A cross-sectional study examined the knowledge of breast cancer, attitudes toward breast self-examination (BSE), and practice of BSE among a sample of female health care workers in Tehran, Iran. The results indicated that seventy-five percent of the women knew about breast cancer prevalence. Although 73% of

women did know that contact with a relative with breast cancer could not lead to development of breast cancer, the respondents' knowledge of risk factors of breast cancer was not satisfactory. With regard to women's attitudes toward BSE, the majority believed that it is not difficult and time consuming or troublesome . Sixty-three percent of the respondents claimed that they know how to examine their breasts, but only 6% performed BSE monthly. The practice of BSE was significantly associated with age ($p = 0.01$), the level of education ($p< 0.0001$), personal history of breast problems ($p< 0.0001$), and knowledge of how to examine the breasts ($p< 0.0001$). The study findings suggested that considering the role that health care workers may play in communicating health behaviors to the general public, the knowledge and behaviors of female health care workers concerning breast cancer is relatively poor and should be improved (Haji-Mahmoodi et al., 2002). A descriptive study conducted in Tehran investigated the role of Muslim religious beliefs on BSE practices. The results showed the vast majority of the women believed that BSE was not against their religious beliefs. With regard to CBE, although more than half of the women preferred to be examined by a female physician , forty seven percent said that CBE by a male physician was not against their Islamic beliefs. However, the results also indicated that only

six percent of the women performed BSE on a regular basis (Montazeri et al., 2003).

Screening Behaviors of Immigrant Women

Immigrant or racial minority populations are challenging to study since representative population-based sampling is difficult because there are relatively small numbers of immigrants in the general population and the surveys must be bi -or multilingual (Wismer, 1998). According to Wismer (1998), these large surveys do not sample adequate numbers of women from racial and ethnic minorities to allow for meaningful analysis. Since the surveys are conducted in English, only occasionally in Spanish, they tend to exclude recent immigrants who are less likely to speak English.

Overall research indicates that immigrant women tend to under use healthcare and many of the studies that have addressed this topic reported that immigrant women use general or primary health care, prenatal care, mental care, and cervical and breast cancer screening less than other nonimmigrant women (Lipson and Hosseini, 1995). In California, the 1993 and 1994 Behavioral Risk Factor Surveys (BRFS) revealed that Hispanic and Asian/Other women were less likely than white women to have mammography (Davis, 1996). In Hawaii, 1993 survey revealed that Filipino and Hawaiian women were significantly less likely than white or Japanese women to have mammography (Hawaii, 1996).

Immigrant women also access health care less than native-born women including native-born minority women of their own ethnic background . Studies that include large proportions of immigrants , and that are population based and include bilingual surveys, indicate low rates of screening compared with the predominantly white populations and even lower rates of screening among first generation immigrants. Among the surveys conducted in California one that was completed in 1994 revealed that Latina, Chinese, and Vietnamese American women , most of whom were born outside the United States were significantly less likely to ever or recently have mammography, CBE , or pap smear compare to a comparison group of white women (Hiatt, 1996). A 1994 survey indicated that Korean American women, most of whom were born in Korea, had lower rates of testing than women of all races and ethnicities (Kang, 1997).

Immigrants are more disadvantaged and face numerous barriers in accessing health care than nonimmigrant minority women. Cancer screening barriers include: cost in particular for undocumented immigrants, provider relationships, lack of female physicians, women's lower status and men's gatekeeping, transportation and language (Crane, et al., 1996). A study of a convenience sample of older Korean American women, revealed that women were more likely to ever have a mammogram if their doctor

recommended the test, they were comfortable asking for the mammogram, more friends or relatives had had one or did not have transportation problems (Maxwell, Bastani, Warada, 1998).

Immigrant women who are unemployed, less acculturated, less educated, with lower socio-economic status and not comfortable with their language skills have had the greatest screening barriers. A study of Vietnamese American women, many whom were first generation immigrants suggested that socio-demographic and acculturation factors were more important correlates of breast cancer screening than attitudes and beliefs or access (McPhee, 1997).Women age forty and older who had less education or had immigrated more recently were less likely to have had mammograms in the past two years (McPhee, 1997).

Despite the fact that Latina women have lower incidence rates for breast cancer than white non-Latina women who develop breast cancer, they are more likely to die of the disease (O'Malley et al., 1999). These differences in mortality is in part related to Latinas being diagnosed at a later stage of breast cancer (O'Malley et al., 1999). Several studies of Latinas, have investigated correlates of breast and cervical cancer screening. Researchers have found that socio-cultural and economic barriers, including

education, culture, income, and age, contribute to underuse of cancer screening methods among this population (Esterada, Trevino,& Ray, 1990).

A 2000 survey investigated the differences in Mexican-born and US born women of Mexican descent regarding factors related to breast cancer screening behaviors. The study revealed that US born women had significantly higher levels of income, education, and acculturation and were significantly more likely to be covered by health insurance and to receive health professional interventions such as BSE instruction. Accordingly, these US born women engaged in BSE more frequently and were more motivated to engage in other health behaviors. On the other hand the Mexican born women reported lower SES, were less likely to be covered by health insurance, had lower levels of acculturation, received fewer health professional interventions, performed BSE less frequently and were less motivated to engage in health behavior.
In addition they had a stronger belief that breast cancer is a serious illness and they were more relatively more susceptible to this illness (Borrayo and Guranaccia, 2000).

As a result, Latina women are often diagnosed with breast cancer when options for treatment are few and optimum results are not expected.

Among non-Latina white women in the US, the incidence of more progressive stages of breast cancer has slowly declined compared to Latina women of the same age group (Breen & Kessler, 1994; Smigel, 1995).

Suarez (1994), examined the influence of acculturation and assimilation on the cancer screening behavior of Mexican American women living in a large southwestern border community. In addition to both language use and social interaction with members of the mainstream society, effects of cultural values and family attitudes were also examined. The study confirmed the often observed finding that language use is important in identifying groups of women in need of cancer screening services (Harlan et al., 1991; Solis et al., 1982; Marks et al., 1987). An interesting finding of this study was the independent positive effect of Mexican family attitudes and values on mammogram screening (Suarez, 1994)

A 1999 study investigated whether acculturation was associated with the receipt of CBE and mammograms among Colombian, Ecuadorian, Dominican, and Puerto Rican women aged 18 to 74 in New York City. The study indicated that greater acculturation was significantly associated with higher rates of screening by CBE and mammograms. This relationship held after

adjustment for socioeconomic status, health status, demographic and cancer attitudes and beliefs (O'Malley et al., 1999).

Scarinici and colleagues conducted a study that examined whether low-income Latina immigrants were less likely to receive a Pap smear than low-income non-Latinas and explored ethnic differences regarding cervical cancer knowledge and the socio-cultural factors associated with cervical cancer screening among low-income Latina immigrants. Participants included 225 low-income women (50% Latina immigrants and 50% non-Latinas). The results showed that Latina immigrants were less educated and less likely to have health insurance. All non-Latinas had a pap smear in the past compared to 81.3% of Latina immigrants. Latina immigrants displayed significantly less knowledge regarding cervical cancer than non-Latinas. The investigators suggested that Latina immigrants tended to display culturally based knowledge and beliefs regarding cervical cancer and screening that may influence getting a Pap smear (Scarinici, et al.,2003)

A recent study (2004) examined beliefs, attitudes, and personal characteristics that correlated with self-reported cervical cancer screening history among Hispanic women aged 18 to 25 years old in El Paso, TX, a large metropolitan area on the U.S.-Mexico border. Results showed that the respondents understood the seriousness of cervical cancer, their susceptibility to cervical

cancer, and the benefits of Pap testing; however, only 61% agreed that most young women whom they know have Pap tests. Greater acculturation and the belief that most young unmarried women have Pap tests were positively associated with ever having screening. The perception that the test would be painful and not knowing where to go for the test were negatively associated with ever having a Pap test (Byrd et al., 2004).

There is little knowledge available on breast cancer screening behaviors of Middle Eastern immigrant women living in United States and no published studies have explored the health practices of Iranian immigrant women in particular. So far only one study has addressed knowledge, proficiency and frequency of breast cancer screening among immigrant Muslim women in United States (Rashidi and Rajaram, 2000). This study used a convenience sample of 39 Asian-Muslim immigrant women from Afghanistan, Pakistan, Saudi Arabia, Palestine, Israel, Iraq and Iran. Ages ranged from 20 to 48 years old. The results indicated that majority of women had never had a CBE and none of the women over 40 years of age had ever had a mammogram. Most of the women (85%) had heard of BSE and (74%) had not examined their breasts for lumps. None of the women had examined her breasts monthly for lumps during the past year.

Although this study was limited due to the small restricted sample size the results still indicated that most of the women in the study were not knowledgeable about the importance and practice of BSE as a means of early detection of breast cancer. These findings were consistent with other studies that indicate lacking awareness of breast cancer screening among Asian immigrant women (Rashidi, 2000). Most of the women in this study were had low income and experienced restricted access to health care. Since the results also showed that the women had low rates of CBE and mammography, Rashidi points out that knowledge and practice of BSE may be the sole method for early detection of breast cancer for these women. Women who knew about BSE learned the technique from sources other than medical professionals and they were less likely to be part of social networks that have access to medical information pertaining to BSE (Rashidi, 2000).

Rashidi (2000), argues that the unique complexities in the socio-cultural backgrounds of Asian Muslim immigrant women could also hinder access to healthcare services. Among the socio-cultural barriers are patient-physician communication difficulties and beliefs about cancer and cancer prevention. Physician communication problems exist due to religious, cultural and linguistic differences between older Asian Muslim women and their physicians.

Furthermore, research also indicates that physicians are less likely to share information with individuals whom they perceive to be different from themselves in terms of social class, ethnicity, gender, and age (Meleis et al., 1995). Health care professionals may also have stereoptypical ideas about Muslim women as being powerless, uneducated and subservient (Meleis et al., 1995). In fact research shows that physicians are less likely to recommend mammograms to minority women (O' Malley et al., 1997). Considering that physician recommendation is one of the most determinants of mammography, the lack of communication between physician and the patient is especially detrimental to breast cancer screening rate in this group.

Physical examination of intimate body parts is a barrier to screening for Asian and Latina women. This barrier includes a woman's concern for maintaining her own expectations of modesty and the attitudes of her male sexual partner. Although there is little information about the cancer screening behaviors of Muslim women, concern for modesty has also been seen in these communities (Rajaram and Rashidi 1999). Patriarchal marital beliefs and gender roles also dictate the support women have for early detection behavior. Studies show that women concealed their participation in breast cancer screening from their male partners or

did not seek help for symptoms because their husband did not want a male doctor to perform their breast examination (Salazar, 1996). In regards to Muslim women, Rajaram and Rashidi (1999) point out that men inappropriately use Islam to justify their authority and dominance over their spouses which in term creates another barrier for breast cancer screening. Usually an expectation of obedience to spouse who exerts control over family health decisions is in conflict with the expectation to remain healthy in order to serve the needs of the family.

In conclusion Rashidi and Rajaram (2000), underline the need for future research that is focused on gathering data on knowledge, attitudes and beliefs related to breast cancer screening and therefore increasing immigrant Muslim women's awareness of their risk for breast cancer and also creating awareness among health care professionals concerning the low rates of breast cancer screening.

Social support

It has been well established that there are strong links between social support and positive health outcomes. Social support has been defined as the exchange of resources between at least two individuals, the provider and the recipient, with the goal of improving the recipient's well-being (Kompore et al., 1997). Individuals with social and community ties show lower morbidity

Individuals with social and community ties show lower morbidity and mortality rates than those lacking social support (House et al., 1988). Social support can influence individuals in three ways. It can influence individual's assessment of how stressful an event might seem, it can influence their assessment of coping options and it can directly impact health behavior (Kompore et al., 1997). Four different functions of social support have been described; emotional support, instrumental support, appraisal support, and informational support (Kompore et al., 1997). Many studies have reported the positive influence of social support on women's psychological well being and coping abilities through every stage of breast cancer (Hoskins et al., 1996; Lugton, 1997).Emotional support is offered by family members in the form of trust, concern, and listening. Examples of instrumental support are money, time, labor, and transportation. Peers provide appraisal support that increases the individual's self-esteem. Information support includes advice, suggestions, information, and directives (Gotay and Wilson, 1998).

Some studies have specifically explored the influence of social support on breast cancer screening. McCance and collegues (1996) examined the importance of influence of other people in getting women to obtain breast cancer screening. A descriptive study of

129 women completed the researcher-developed, Likert-type scale-Influence of Others Scale. A comparison of the means and t-test analyses between those who performed the recommended screening behavior with those who had not revealed that the influence of family and friends and the influence of knowing someone with breast cancer were significant for each of the three screening behaviors. Regression analyses revealed that the influence of others was highly significant to the practice of breast self-examination and less so for mammography and clinical breast examination.

A study by Wagle et al., (1997) investigated the relationship between social support and the frequency and accuracy of BSE practice. The sample consisted of 22 women, 55 years of age and older, who were having routine examinations at a small Midwestern gynecologic clinic. Social support was found to be significantly related to the frequency of BSE , but not to the accuracy of BSE. The results also indicated that these women had lower social support scores compared with younger women (Wagle et al., 1997).

Another study examined the influence of social support and adherence to recommended breast cancer screening guidelines (Katapodi et al., 2002). The study participants were 833 mostly low-income women with a mean age of 46.2 years from three racial or ethnic groups (Latina, Caucasian, and African American) who were not breast cancer survivors. Social support was measured

with a five-item, four-point, Likert scale developed for the study. Adherence to screening guidelines was measured by asking frequency of performing breast self-examination (BSE) and frequency of obtaining a clinical breast examination (CBE) and a mammogram. The results showed higher levels of social support were related to higher income and higher education. Lower levels of social support were associated with being Latina, completing the survey in Spanish, and being born abroad. Women who did not adhere to screening guidelines (for BSE or CBE) reported less social support (Katapodi et al., 2002).

In general the literature suggests a direct link between an individual's interaction with social networks and the use of breast cancer screening. These findings underscore the potential importance of using specific women's social networks to reinforce breast cancer screening.

Knowledge of Breast Cancer

Many studies have explored breast cancer knowledge in specific ethnic groups and the effect of this knowledge on screening behaviors. According to Reddy and Alagna (1986), the relationship between knowledge and practice is not simple. Knowledge of risk, such as personal experience or family history of breast cancer increases the likelihood of BSE, but these findings are not

consistent. Studies found that 50% of mastectomy patients were not performing BSE on a regular basis before surgery despite their physicians' recommendations. Those who were not practicing BSE reported that routine physician examination was sufficient and BSE would add to their level of anxiety (Grover et al.,1983 ;Taylor et al., 1984).

Other studies that examined BSE among with fibrocystic disease found such women to be more knowledgeable and more likely to practice BSE (Kosch and Spring 1983). On the other hand, another study found that the women with fibrocystic disease were no more proficient or likely to practice BSE than women without benign breast disease (Reddy et al., 1983).

One study that compared women with family history of breast cancer to a similar group of women with no increased risk found that although the high-risk women were more knowledgeable about BSE and slightly more fearful of examining their breasts they were not more likely to be practicing BSE monthly(Reddy et al., 1986).

Several studies found that knowledge of the etiology of and risk factors for breast cancer had a statistically strong relationship with BSE (Amsel et al., 1984; Dickson et al., 1986; Roberts et al., 1984; Reeder et al.,1980). Champion (1987) also reported knowledge to be the second highest predictor of frequency of BSE.

A study of undergraduate and graduate students found knowledge of risk factors was associated with frequency of BSE in graduate students and with proficiency and frequency of BSE among both undergraduate and graduate students (Mammon and Zapka, 1986). Other studies have found no correlation between breast cancer knowledge and screening behavior (Magarey, 1977; Schulter, 1982). Braily (1986), found that when BSE technique and frequency improved there was no corresponding increase in breast cancer knowledge.

Sources of information vary and can include family and friends, physicians, work place, radio, television, magazines and pamphlets (Metsch et al., 1998). Metsch and colleagues (1998) reported key determining informational factors that led women 40 and up to obtain mammograms. They conducted a community wide telephone survey, in English and Spanish, of a stratified random sample of 999 white, black, and Hispanic women in Dade County, Florida. The results indicated that physicians, as sources of information, serve to motivate women to obtain a mammogram. This was even accurate after taking into account the patient's age and utilization of the healthcare system for preventive care in general. The study concluded that clinicians must be aware of national breast cancer screening guidelines; of the risks and

benefits of screening measures; and of the implications of a positive and negative test result (Metsch et al., 1998).

Instruments to Measure Breast Cancer Knowledge

A review of the literature resulted in three published instruments for measuring breast cancer knowledge (McCance et al., 1990 ; Roberts et al. ;1984 ;Stillman, 1977). The most widely used instrument was developed by Stillman , a four item, multiple - choice questionnaire. The questions about knowledge were part of the questionnaire on general health beliefs, therefore knowledge about breast cancer was not the major emphasis. To establish content validity, items were read to five nursing graduate students. Reliability was determined using only 20 women.

Roberts et al., (1984) published a structured interview that was designed to assess the knowledge of Scottish women regarding breast cancer and BSE. It contains five items on breast anatomy, physiology and breast cancer, four questions in relation to breast cancer curability, screening and detection. No validity or reliability measures are reported.

McCance et al., (1990) developed the Breast Cancer Knowledge Test (BCKT). The instrument is an expansion of Stillman's knowledge questionnaire. BCKT consists of 18 multiple-choice and dichotomous (true/false) responses. Four experts in the field of oncology were used to establish content validity. Reliability

testing was conducted on a convenience sample of 101 women aged 50 or older. The reported internal consistency reliability using Kuder-Richardson 20 statistic (KR20) was .81.

The BCKT can be used for the designing and targeting interventions for promoting earlier breast cancer detection. It has application in a variety of settings, such as primary care, the community, and the work place. Investigators can test use this instrument in various populations as a tool to measure knowledge of breast cancer (McCance et al., 1990).

Conceptual Frame Work

The Health Belief Model (HBM) will be used as the conceptual framework for this study. The HBM was first introduced in the 1950s by Hocbaum, Leventhal, Kegeles, and Rosenstock (Rosenstock, 1974). Over the past three decades this model has become one of the most influential and highly utilized approaches to understanding health related behavior (Harrison, Mullen,and Green, 1992). The model has been used in cancer research to understand screening participation. The original four concepts of the model were: perceived susceptibility, perceived seriousness, perceived benefits and perceived barriers (Becker, 1974). General health motivation was later added to the model and refers to beliefs and behaviors related to state of general concern about health. The general health motivation concept basically suggests that a woman

is more likely to perform BSE if she also is concerned with her health in general.The general health motivation been found to be positively related to BSE (Alagna and Reddy, 1984; Champion, 1987; Hallal, 1982 ; Williams, 1988).

The concept of confidence which is defined as the belief that one can successfully execute a behavior that will then lead to a desirable outcome, was also added to the model. The term confidence was equated by Rosenstock with Bandura's construct of self-efficacy (Bandura, 1977). Bandura's theory of self-efficacy (the conviction that one can successfully execute the behavior required to produce the outcome), holds that self-efficacy expectancies serve as a primary mechanism guiding social behavior. But the influence of measures of self-efficacy on behavior has been strengthened when related to specific domains, not just measured globally (Strecher and Rosenstock, 1997). A significant positive relationship has been found between BSE and self-efficacy (Brailey, 1986,: Edgar et al.,1984: Lauver and Angerame, 1988).

These findings suggest the need to identify and measure specific domains, including self-efficacy expectations specifically related to self domains as a useful addition to a model examining a specific health behavior.

The HBM has appeared most often in literature explaining breast cancer screening and interventions based on the HBM variables of perceived susceptibility, benefits and barriers have been shown to increase breast cancer screening (Champion and Huster, 1995).

The HBM proposes that attitudinal variables precede a health related action and influence the course of that action. With roots in an expectancy-value theory model, it postulates that breast cancer screening behaviors are the result of decision-making based on a) perceived susceptibility, b) perceived seriousness, c) perceived benefits, d) and perceived barriers to action. According to the HBM before people undertake preventive or curative actions a threat must be recognized. For example in the case of mammography a woman must perceive that breast cancer is both serious and that she is personally susceptible to breast cancer. Studies have shown that an increase in perceived susceptibility has been associated with an increase in breast cancer screening (Stein, Fox, Murata and Morisky, 1992).

Perceived benefits which focuses on the effectiveness of specific behavior in reducing the threat of the condition and perceived barriers which relate to the negative aspect of the

anticipated behavior are also central constructs of the HBM. In mammography screening, benefits relate to early detection of breast cancer and as a result avoiding death. Barriers in the case of mammography could include fear of cancer, pain, cost, travel and time (Champion and Menon, 1997). Researchers have demonstrated that increased benefits and decreased barriers are linked to increased screening (Champion, 1992; Rakowski et al., 1992; Slenker and Grant, 1989).

Champion's work in 1984 in the development of valid and reliable scales for measuring health beliefs with regards to BSE and breast cancer was the first comprehensive instrument. Champion's (1985) adaptation of the HBM with regard to BSE has been used to predict relationship among women's health beliefs regarding breast examination and BSE frequency (Champion, 1984), with barriers accounting for most of the explained variance. In 1985, the constructs of confidence and health motivation were added to the scale. Health motivation accounted for 26% of the variance, along with susceptibility, seriousness, benefits, and barriers. In a 1993 study Champion used 58 women ages 35 and up to refine her instrument.

The instruments construct validity and predictive validity for BSE behavior was established. Cronbach's alpha reliability coefficients for the revised scales ranged from .80 to .93.

Most researchers have shown relationships between HBM variables and mammography compliance, with the strongest correlations existing between benefits and barriers, respectively, and compliance (Beaulieu,et al.,1996 ; Friedman et al., 1995; Lerman et al.,1990; Slazar and deMoor,1995). A Study on women 65 and over showed that older women do not feel personally susceptible to breast cancer and, although they consider it serious they do not see it as a threat to their lives in the next 5 years (Champion, 1992). Most women seem to believe in the efficacy of BSE, but find it difficult to remember to perform BSE. In addition, women seem to find it embarrassing to perform BSE and to look at an aging body in the mirror. The majority also lacked confidence in performing BSE. Consistent with these findings several authors have found that older women have less knowledge about the importance of mammography (Dolan et al., 1997;Suarez et al., 1997). Suarez et al., (1997), reported that among 923 Mexican American women, those aged 65 or older were least knowledgeable about cancer detection methods and screening guidelines. In two

independent studies where the researchers examined African American and Mexican American women, women with more knowledge were more likely to have had mammograms and were younger (ages 40-49)(Suarez et al.,1997;Danigelis et al., 1996). In another study that was aimed at identifying age and racial differences in mammography practices of African American and Caucasian women indicated that after controlling or income and education younger Caucasians and older African Americans had the highest total barrier scores. The main reasons cited at baseline for not getting a mammogram were significantly different for Caucasian and African American women. Pain was cited significantly as a barrier for younger Caucasian women. There was an age and race interaction, with older African American women most likely to fear exposure to radiation. This may be due to the historical evidence that African Americans were sometimes used against their will or knowledge in research which sometimes included unnecessary radiation (Rawl et al. ,2000).

Several methodological problems have been addressed that could have weakened conclusions drawn from studies using the HBM (Aiken et al., 1994). Problems such as the tendency to use single indicator measures with unknown poor reliability and validity; the omission of some constructs or combining the HBM constructs into one construct; the dilution of outcome measures by

combining "ever had" responses in mammography screening with those who are fully compliant with screening guidelines ; and the use of stepwise regression analyses instead of the more preferred hierarchical analyses procedures in which predictors are entered into the equation in the order specified by the theory.

The purpose of this study is to collect information about prevalence of early breast cancer detection behaviors among a population of Iranian immigrant women in California. Specifically, this study will examine the relationship between the health belief model (HBM), knowledge related to breast cancer, health-professional recommendation, selected demographic variables, acculturation and compliance with recommended early breast cancer detection guidelines.

CHAPTER 3

METHODS

The purpose of this study was to describe breast cancer screening behaviors among a population of Iranian immigrant women in California. Specifically, this study examined the relationship between the health belief model (HBM), knowledge related to breast cancer, health-professional recommendation, selected demographic variables, acculturation and compliance with recommended early breast cancer detection guidelines.

Sample Size And Inclusion Criteria

According to the literature the correlation coefficients among the HBM constructs and breast cancer screening behaviors ranged from .20 (small effect size) to .30 (medium effect size). The sample size was determined by using Cohen's (1977) formula for regression analysis. In order to achieve an alpha of .05 with a medium effect size of f^2= .30, and a power of .80 for a regression analysis with 10 independent variables an estimated sample size of 90 subjects per group (compliant vs. noncompliant) was estimated for this study. Therefore the total minimal sample size desired was 200.

The participants in this study consisted of self-identified first generation immigrant Iranian women who were born and/or lived in Iran before they migrated to the United States. The inclusion criteria for the participants were: a) women between the ages of 30-80 years who lived in California, b) women were able to read and speak English and /or Farsi.

Instruments

The data was obtained using the Breast Health Questionnaire (BHQ). The BHQ was developed by the investigator. This instrument was designed using a selection of questions from the Champion's Health Belief Model Scale (HBMS), the Breast Cancer Knowledge Test (BCKT; McCance et al. 1990), and Marin 's Acculturation scale (1987). The BHQ was composed of 92 items and was a six part, self-administered questionnaire, consisting of the following sections, 1)breast cancer screening behaviors profile ; 2) health professional intervention/ recommendation ; 3)breast cancer knowledge ;4)health belief's about breast cancer ;5) acculturation level and ;6) background information. The last question provided a space for any additional comments the participants might have. The questionnaire was combined into a booklet and translated into Farsi, using the method of back-translation for those participants who did not have a sufficient

knowledge of English and were more comfortable with Farsi. Participants needed approximately 15-17 minutes to complete the questionnaire.

Previously developed mammography, CBE, BSE behavior indices developed by the ACS guidelines were adapted to measure compliance/frequency of early detection behaviors. The following ACS guidelines were used (ACS, 2003):

- Breast self-exam monthly for women aged 20 and over.
- Clinical breast examination for women aged 20-39, every three years.
- Clinical breast examination for women over 40, every year.
- Mammography for women aged 40 and over, every year.

The first section of the questionnaire (Qs 1-12) assessed the participants breast cancer screening practices. A participant was rated as compliant if her breast cancer screening behavior was consistent with guidelines set by the ACS. The subject was rated non-compliant if she did not follow the recommended screening guidelines specified by ACS and in accordance with her age. Breast cancer screening was measured by obtaining information on frequency/compliance with BSE, CBE, and mammography screening. Women were asked whether they ever had that procedure and were coded accordingly (yes/no/ Not Applicable). The women were also asked if they had been recently screened. Regarding mammography in addition to compliance/frequency

items were developed to assess purpose and total number of mammograms.

Health professional intervention/recommendation was assessed by asking :1) if a health professional (for example doctor, nurse) has taught them how to perform breast self-examination ; 2) if a doctor has recommended that they have a mammogram.

Champion's Health Belief Model Scale (HBM scale) was used to assess health beliefs. This instrument was developed by Champion to assess women's health beliefs and attitudes about breast cancer and breast cancer screening (Champion, 1984, 1993). The instrument consists of six subscales: susceptibility to breast cancer, belief in the seriousness of breast cancer, perceived benefits of BSE and mammography, perceived seriousness of BSE and mammography, confidence in performing BSE, and health motivation. Each subscale consists of series of statements to which respondents indicate extent of agreement on a five point Likert scale from "strongly agree" to "strongly disagree". Scale ratings are averaged to create a mean-sub scale score, with higher scores reflecting greater levels of the constructs.

Scales were assessed for content validity by a panel of 3 nationally known judges familiar with the HMB and breast cancer screening. Scales were revised based upon analysis for content validity and administered to a probability sample of 581 women

who were participants in a large intervention study. Champion reported Cronbach's alpha reliability coefficient for the scales ranged from .75-.93. Test –retest reliabilities reported for susceptibility, health motivation, confidence, and barriers ranged from .65-.70 with the exception of benefits of BSE and mammography and seriousness, test-retest reliability was .45. Predictive validity of the instrument was established assessing the relationship between the HBM sub-scales and breast self-examination and mammogram behaviors using multiple regression and bivariate correlations (Champion, 1993).

The Breast Cancer Knowledge Test (BCKT) was used to measure subjects' knowledge of breast cancer detection and screening practices. The instrument is an expansion of Stillman's knowledge questionnaire. BCKT consists of 18 multiple- choice and dichotomous (true/false) responses. These include 4 generic breast cancer items, 3 items pertaining to mammography , and 12 items related to BSE . Four experts in the field of oncology were used to establish content validity. Reliability testing was conducted on a convenience sample of 101 women aged 50 or older. The reported internal consistency reliability using Kuder-Richardson 20 statistic (KR20) was .81.

Acculturation was measured with a tool developed by Marin and colleagues (1987). This scale measures acculturation on the

basis of length of time in the United States, language use, linguistic proficiency and social networks. The overall scale has a reliability of 0.92. and a validity of 0.65. This scale measures : 1) language use items 1-4 ; 2) social network items 4-7. Acculturation level is measured utilizing a five point Likert-type scale. Scores range from one to five, with five indicating the highest degree of acculturation. An average score of 2.99 or less on the total score indicates low acculturation.

History of Breast abnormalities was assessed by asking whether the woman has ever experienced ;1) unusual pain, swelling or a lump; 2) an abnormal mammogram that resulted in further testing; 3) both or ; 4) none. Family history of breast cancer was assessed by asking the woman if anyone close to her had ever been diagnosed as having breast cancer (yes/no). Personal history of breast cancer was assessed by asking the woman if she had ever been diagnosed with breast cancer (yes/no).

Social support on breast cancer screening was assessed using three subscales measuring the perceived support from 1) husband/partner; 2) family/relatives; and 3) friends as it relates to compliance with breast cancer screening guidelines.

The demographic questionnaire gathered information about age, education level, income, marital status, length of stay in the United States, regular physician, provider's gender and language

and health insurance coverage and social support on breast cancer screening.

Age was measured by number of years. Education was measured by level of education completed and ranged from no formal education (Level 1) to doctoral degree (level 10). Income was assessed using discrete categories but was placed at the end of the instrument to minimize non-response. Marital status utilized four categories: married, widowed, divorced/separated, and never married. Occupation was assessed by whether the person is employed, unemployed, retired, or full-time homemaker. Length of stay was measured by the number of years lived in the United States. Single items measured :1)whether the individual has regular source of health care (yes/no); 2) has health care coverage (yes/no); 3) health care provider's gender (male/female); and 4) health care provider's language (English/Farsi/Other).

Instrument Validity

Face and content validity of the instrument was evaluated by seven experts in the fields of public health, nursing, and medical anthropology research. The panel of experts was asked to rate the items for wording, relevancy, importance and cultural sensitivity. Length and the clarity of the questionnaire was also considered.

The panel rated each question by using a 4-point Likert scale with responses varying from "disagree" to " strongly agree". The panel reviewed scale items and made recommendations for modifications and deletions. They also gave their general impression and comments about the survey. Items agreed by all experts were retained. Some comments addressed the wording and relevancy of some of the breast cancer knowledge questions. Other comments were related to the content of the Health Belief Model Scale (HBMS), and how the scale could be made more culturally suitable for this specific population.

Five questions were deleted from the breast cancer knowledge scale and a third response option (Don't Know) was added to the True/False questions. In addition, the panel suggested deleting several items from the HBMS due to lack of cultural relevancy plus making changes in the wording of the HBMS. Therefore, a 41-item HBMS was used to explore Iranian women's health beliefs about breast cancer screening. Modifications were made according to the feedbacks and a revised version was submitted to the panel.

Instrument Reliability And Pilot Test

Prior to the pilot study approval was obtained from the Oregon State University Institutional Review Board. Twenty women who met the inclusion criteria were recruited and asked to

participate in the pilot study. Through both a cover letter and verbal instruction the participants were informed about the purpose of the study, the procedures and that their participation was voluntary and their responses would remain confidential.

A pre-test questionnaire was given to all 20 women. From the twenty women eighteen completed and returned the pretest questionnaire. Two weeks later the 18 women who had responded to the pre-test received a second questionnaire (post-test). Sixteen women completed the post-test questionnaire. Test-retest analysis was conducted to establish the reliability of the instrument. Correlation coefficients ranged from .79 to .99. and were significant at $p<.05$.

Internal consistency reliability assessment using Cronbach's alpha was conducted for the pre-test survey. Item analysis of each subscale was performed. Cronbach's alpha values below .50 present poor reliability, values between .50 and .75 suggest moderate reliability and values above .75 present good levels of reliability(Santos, 1999).

The adapted HBMS consisted of 41 items with nine subscale to measure constructs of seriousness (6 items), benefits to BSE (5 items), barriers for BSE (4 items), confidence in BSE (1 item), barriers for CBE (5 items), benefits to CBE (5 items), benefits for mammogram (6 items), barriers to mammogram (4 items), and

health motivation (6 items). The assessment of internal consistency of the modified HBMS revealed an acceptable Cronbach's alpha of .88 with internal consistency reliabilities ranging from .69 to .87. The internal consistency reliability for breast cancer knowledge scale (11 items) was .70. The acculturation scale consisted of 7 items with two sub-scales to measure constructs of language use preferences (3 items) and social network preferences (4 items). The internal consistency reliabilities was .74 and .80 for each subscale. The Cronbach's alpha for the combination of two sub-scales was .84. The social support scale had three sub-scales to assess support from husband/partner, families and friends for BSE, CBE and mammogram. The internal consistency reliabilities for each sub-scale ranged from .82 to .96 and the Cronbach's alpha for the combination of the three sub-scales was .90.

Instrument Translation Technique

For the purposes of this cross-cultural study the BHQ was translated to Farsi, which is the language of the cultural group being studied. The back-translation procedure was used (Brislin, 1970). Two bilingual women with backgrounds in nursing and public health served as the translation panel. During this procedure the instrument was translated into Farsi (target language version) by one translator, a second translator translated it back

from Farsi to English. Items with apparent differences between the second language (target), and original language were then modified. Three versions were therefore developed: 1) the instrument in its original form, 2) the target language version, and 3) the second source language version, which is the result of the back translation. Evaluations of the conceptual equivalency of the two versions of the instrument (the source version and the target version) were assessed through pilot testing the translated instrument with the members of the target population. Eight women from the target population pilot tested the translated instrument to determine clarity of the instrument. After several meetings with the translation panel and the women who took the pilot test modifications were made in wording and format of the BHQ to enhance clarity and insure cultural sensitivity.

Procedures

Since there were no existing documents with a complete list of Iranians living in the United States a non-probability sample was used in this study. After obtaining approval from the OSU Institutional Review Board, the recruitment process was initiated.

In order to provide broad socioeconomic participation, the investigator contacted several community centers, cultural centers, Farsi schools, women's groups, community affiliated- service organizations, and local mosques in California and requested that

the goal and importance of the research be described through community newsletters, email list serves, public announcements and social networking. An invitation to participate in the study was also posted on a popular Persian news website and was updated periodically. To recruit participants the investigator attended monthly meetings , seminars and informal gatherings to explain the purpose and significance of the research. Although the investigator was not permitted access to the directory of any of the organizations, permission to recruit and distribute the surveys during organizational activities was requested and obtained from the directors of the organizations. Public housing and student housing services were also contacted and the investigator posted announcements in their facilities. Women who resided in public housing and contacted the investigator were designated a day for completing the survey. The investigator visited the women and administered the survey in person.

The investigator visited Persian restaurants and grocery stores and asked the owners to post recruitment notices. One restaurant owner volunteered to help with the study and even took 40 surveys to distribute among family and friends.

Several special events such as the Iranian Women's day, Mother's day and religious celebrations were held during the data

collection period. The investigator attended all these special events and recruited subjects. The directors of two major Iranian American professional organizations in southern and northern California were contacted to seek assistance in recruitment. After many attempts the board of directors of the Network of Iranian-American professionals of Orange county agreed to let the investigator attend the 8th annual Persian harvest festival of autumn (Mehregan) and recruit subjects for the study. In this festival the ancient Persian Goddess Mehr, the spirit of love, knowledge and commitment, is honored. By celebrating nature and the seasons, many aspects of Persian culture from exhibits, art, pop and traditional music, and folk dance to crafts, ancient sports, live performances, movies, children's activities and exotic food are illustrated. For the last eight years this two day event has attracted tens of thousands of people to Orange County, CA. It is the largest Iranian-American gathering in the United States with over 20,000 visitors. This was a wonderful opportunity to increase the diversity of the subjects in the study. During the festival surveys were distributed to potential participants at different sites by the researcher and several volunteers. Announcements about the study were made on the stage during program intermissions and invited the women to participate. In general people showed interest

in the study and those who refused to participate indicated they did not have the time to complete the survey.

Through further networking the investigator was able to contact the Iranian Federated Women's Club (IFWC) a non-profit educational and service organization in the Bay Area. The IFWC also sponsors an Iranian cultural school and organizes monthly gatherings for Iranian senior citizens. The director of IFWC agreed to send out information about the study on their list serve. Two of the IFWC members responded and offered to help with the study. Both women were graduate students and assisted with survey distribution during monthly meetings. In addition, they helped recruit and distribute surveys among potential participants at the Iranian cultural school, which operates only on Saturdays. At start of the senior citizens monthly meeting the IFWC president made an announcement about the study and encouraged senior citizens participation. The director also assigned helpers to aid the elderly women in completing the survey.

By surveying a variety of groups and multiple settings, the researcher intended to increase the diversity of the women participants in terms of age, education, and income. Upon recruitment each participant received a questionnaire package in the language of their choice (English or Farsi) containing a cover letter with information pertaining to the study, an informed consent

document, the Breast Health Questionnaire and an informational booklet on breast cancer screening. All participants received an informational booklet titled, "Breast Health; What every women should know", donated by the Susan G. Komen Breast Cancer Foundation. This booklet was designed to provide general information about common breast changes, breast cancer risks and options for breast cancer screening and treatment. Each participant was asked to complete the BHQ and return the survey to either the researcher or the contact person. To increase on site response rates participants who completed and returned the survey immediately received a keep T-shirt donated by the American Cancer Society and the Susan G. Komen Breast Cancer Foundation for their voluntary participation.

The women were informed that their participation was on voluntary basis. The participants were also informed that anonymity and confidentiality would be maintained and that there were no foreseeable risks associated with this study. To protect the anonymity of the participants, a signed informed consent document was not required for this project. The informed consent document was given to each participant, but they were not required to sign and return the form with the completed survey, rather, they were asked to keep the informed consent document for her record. Data were collected over a three month period from August 25th to November

30th, 2003 . This extended time of collection was to encourage the opportunity for participation in the study.

Data Analyses

Data analysis was conducted using the Statistical Package for Social Science (SPSS 11.5). Initial quantitative analysis began with descriptive analysis including frequency distributions for variables of interest , accuracy of data input, and missing values. Data analysis began with a total of 361. Eleven surveys were excluded from the analysis because 8 women did not meet the age criterion and 3 women were not residents of California . Nine cases were deleted with missing data exceeding 10%. No patterns of missing values were found. Missing values was low ranging from none to one percent. Only the household income variable had 9.4% missing. Missing data was replaced using the Expectation-Maximization procedure. Therefore, 341 surveys were included in the analysis.

Through inspection of frequency distribution for each subscale score, indicated that the data set had no problems with skewness and kurtosis.

T-tests on the location of the subjects (North and South California) were conducted. The results concluded that there were no differences in response based on the location of the subjects and where the survey was conducted.

In this descriptive study the independent variables were health beliefs about breast cancer, breast cancer knowledge, health-professional intervention/recommendation, history of breast abnormality, physician information, socio-demographic variables and acculturation concepts. The dependent (criterion) variables were breast self-examination (BSE), clinical breast examination (CBE) and mammography. Each variable represented one of the recommended breast cancer early detection behaviors and was dichotomized into compliers and non-compliers. In order to be compliant the women had to follow ACS (2003) screening guidelines appropriate to their age.

Logistic regression is frequently used to predict a binary dependent variable from a set of independent variables. Logistic regression assumptions do not require normality of variable distributions. Therefore for this type of data logistic regression was the most appropriate procedure to identify independent predictors of breast cancer screening.

The logistic regression results appears as odds ratios (ORs) and 95% confidence intervals, which provide the basis for evaluating the magnitude of the differences. An odds ratio, which is the factor by which the odds change for a unit change in the predictors. The Wald statistic is used to assess the significance of individual predictors in the logistic model.

For the purpose of logistic regression, which requires dichotomous dependent variables, the dependent variables, which included ever had and frequency of BSE, CBE and the last mammogram, were recoded. The frequency of screening behaviors were recoded from the original scaling system into a dichotomous scaling system. Women who reported performing one or more BSE every month were recoded into " BSE compliant group". Women between 30-40 years of age who underwent an annual CBE every two to three years were recoded into "CBE compliant group I". Women 40 and older who underwent an annual CBE and had their last CBE within the past 12 months were recoded into "CBE compliant group II". Women 40 and older who had annual mammograms were recoded into "Mammogram compliant group".

The presence of screening behavior was coded as "1" reflecting compliance and "0" reflecting non-compliance behavior in accord with American Cancer Society guidelines.

Selected independent variables were also recoded into dichotomous variables. For example marital status was recoded into two groups married and not married. Social support was recoded from "High-moderate" as "High=1" and from "Low-never discuss" as " Low=0". The breast cancer knowledge scale was recoded as "Correct=1 and Incorrect=0".

The likelihood, a number less than one , is the probability of the observed results based on the parameter estimates. Since the likelihood is a small number and difficult to interpret, -2 times the log of the likelihood (_2LL) was used as a measure to estimate how well the model fit the data.

When the model is a good fit the –2LL is a small number and when the model is a perfect fit the-2LL approaches 0. The goodness –of-fit statistic and Model Chi-Square were also used to determine how well the model fit the data.

CHAPTER 4

RESULTS

ARTICLE 1: INVESTIGATING IMMIGRANT IRANIAN WOMEN'S BREAST CANCER KNOWLEDGE, BELIEFS, ATTITUDES, AND SCREENING BEHAVIORS

Abstract

This article is the first report of breast cancer screening among Iranian immigrant women in United States. The purpose of this study was to describe ; Iranian immigrant women's knowledge, beliefs and attitudes towards breast cancer, and their breast cancer screening behaviors. Methods: 341women were recruited through a snowball sampling technique. The participants in this study consisted of self-identified first generation immigrant Iranian women who were born and/or lived in Iran before they migrated to the United States. The inclusion criteria for the participants were: a) women between the ages of 30-80 years who lived in California, b) women were able to read and speak English and /or Persian. Results: In this study 94.1% of the participants aged 30 and up had heard of mammography. Among women 40 years and older, 92.7% had received at least one mammogram, 55.5% had a mammogram less than a year ago, 25.6% of the women had a mammogram one year ago, and 9.4% of the women reported having undergone mammography more than two years ago.

Routine screening was the reason for obtaining a recent mammogram for 59.5% of the women. The majority (93%) of the women 30 years or older indicated having had at least one CBE. Among the women ages 40 and older, 73% reported having had a CBE every year. Overall 86.2% of the participants had practiced BSE at least once. Only 38.1% participants practiced BSE once a month, 7.6% practiced BSE once every two months, 17.0% practiced BSE once every three months, 9.9% practiced BSE once every six months and, 8.9% practiced BSE once every year. Among the respondents 18.5% of the participants never practiced BSE. The goal of this study was to provide a preliminary understanding of the health practices in this understudied ethnic group. This information will in turn provide suggestions for more focused ethnic specific health promotion programs to increase breast cancer screening behavior among this population.

Introduction

Breast cancer is the second major cause of cancer deaths in the United States (ACS, 2005). American Cancer Society (ACS) estimates that in 2004, approximately 215,990 and in 2005, 211,240 women in the United States are diagnosed with invasive breast cancer (ACS, 2005).

This translates into approximately 1 in 8.2 women will receive a diagnosis of breast cancer in her lifetime, and 1 in 30 will die of the disease (ACS, 2005).

Screening methods and programs are critical strategies for the early detection and timely treatment of breast cancer which makes breast self-examination (BSE), clinical breast examination (CBE) and mammography important health behaviors. There is limited research about cancer risks and screening behaviors of ethnic minorities. Existing research has repeatedly shown that minority women in the US have more advanced stages of breast cancer because of lower breast cancer screening rates and lower survival rates compare to white women(Fox, 1994; Zavertnik, 1993; Bain, 1986). Several factors might explain these difference, including poor or incorrect knowledge and practices relating to early detection of breast cancer as compared with white women, negative attitudes and beliefs, late diagnosis, poor or lack of access to health care, lower use of screening services, and cultural practices (Bain, 1986; Zavertnik, 1993; Fox, 1994; Danigelis et al., 1996; Glanz et al, 1996; Champion and Menon, 1997; Lawson, 1998 ; Bailey et al., 2000; Rashidi and Rajaram, 2000 ; Zhu et al., 2000; Phillips et al., 2001)

Studies that include large proportions of immigrants and that are population based and include bilingual surveys, indicate low rates of screening compared with the predominantly white populations. Lower rates of screening among first generation immigrants is also common (Borrayo and Guranaccia, 2000). Immigrant women access health care less than native-born women including native-born minority women of their own ethnic background (Borrayo and Guranaccia, 2000).

Researchers have paid little attention to variations within different ethnic groups, even though diverse groups have cultural and personality profiles that place them at risk in different ways. In addition, very few studies have explored screening behaviors of first generation immigrant women, specifically in terms of knowledge, attitudes and behaviors towards breast cancer screening.

Preventive health behavior is not homogenous and while the migration experience itself is mediated by gender and age, it is influenced by the changes in socio-economic status, changes in social networks, and the changes in culture (Rogler, 1994). These women's subjective interpretation of their daily life and evaluation of their migration experience is influenced by their pre-migration experiences and cultural frameworks.

Therefore, in order to improve early detection screening for breast cancer of racial and ethnic minority women the vast inter-group variations among these women should be considered so that a "one size fits all" approach is avoided.

As a group little is known about breast cancer screening behaviors of Middle Eastern women and studies that examine breast cancer screening behaviors of Iranian immigrant women are non-existent. Experiences and screening behaviors of Iranian immigrant women might be quiet distinct and different from ethnic groups and cultures that have been previously studied. This supports the need to investigate screening behaviors that may be specific to the Iranian immigrant women because it is unique and different from ethnic groups and cultures that have been previously studied. This research examined breast cancer behaviors and attitudes among Iranian immigrant women living in California, United States. The goal is to provide a preliminary understanding of the health practices in this ethnic group.

This study is also unique because of its target population. Iranians are perhaps the least understood and well-known of any ethnic group in the United States. The US census estimates that Iranian American community numbers around 330,000, with the

largest community of Iranian descent residing in California. However, according to research by the Iranian Studies Group, at Massachusetts Institute of Technology (MIT) Iranian-Americans are far more numerous in the United States than census data indicate. There are estimates that the actual number of Iranian-Americans may top 691,000 to 1,000,000 (ISG MIT, 2005). A report by the Center for Immigration Studies (2000) on the socio-economic status of Iranian immigrants in the US suggests that 60.9% of Iranians have college degrees, with an average annual income of $60,000 and 69.3% home ownership (Center for Immigration Studies, 2000).

Furthermore, this study pertains to popular western culture's depiction of Middle Eastern women and the interplay between simplistic stereotyping and complex realities . In spite of their social, cultural and ethnic differences, Middle Eastern women are frequently portrayed homogeneously which reinforce stereotypes, marginalization, and racial and gender biases. This is generally true in the case of Iranian women since their post-revolutionary national image in the minds of the West is a homogeneous picture of veiled submission. In addition, recent reports highlight the Iranian immigrant community's sensitive and difficult position due to the troubled nature of the US Iranian relationship in the past two and a half decades and the continuing tensions in the U.S. relations with Iran in particular, and

the Middle East in general. The Iranian community in the U.S. has been under stress ever since the 1979 Islamic revolution and hostage crisis in Iran in addition to the alarming number of reports of discrimination and racial profiling post-9/11 .

Methods

The study design was a cross-sectional survey. Three hundred and forty one women were recruited through a snowball sampling technique. The participants in this study consisted of self-identified first generation immigrant Iranian women who were born and/or lived in Iran before they migrated to the United States. Study participants included: a) Iranian women between the ages of 30-80 years who lived in California, b) Iranian women able to read and speak English and /or Farsi.

Instrument

Data were obtained using the Breast Health Questionnaire (BHQ). The BHQ was developed by the investigator. This instrument was adapted from the Champion's Health Belief Model Scale (HBMS), the Breast Cancer Knowledge Test (BCKT; McCance et al. 1990), and Marin 's Acculturation scale (1987). The BHQ was composed of 92 items and included a six part, self-administered questionnaire,

consisting of the following sections, 1)breast cancer screening behaviors profile 2) health professional intervention/ recommendation 3)breast cancer knowledge 4)health belief's about breast cancer ;5) acculturation level and ;6) background information. The last question provided a space for any additional comments for participants. The questionnaire was combined into a booklet and translated into Farsi, using the method of back-translation .Participants needed approximately 15-17 minutes to complete the questionnaire.

Instrument Validity

Face and content validity of the instrument were evaluated by seven experts in the fields of public health, nursing, and medical anthropology . The panel of experts was asked to rate the items for wording, relevancy, importance and cultural sensitivity. Length and the clarity of the questionnaire was also considered.

Instrument Reliability And Pilot Test

Prior to the pilot study approval was obtained from the Oregon State University Institutional Review Board. Twenty women who met the inclusion criteria were recruited and asked to participate in the pilot study. A cover letter and verbal instruction was used to inform participants about the purpose of the study, the procedures, the

voluntary nature and the confidentiality of their responses. A pre-test questionnaire was given to all 20 women. From the twenty women eighteen completed and returned the pretest questionnaire. Two weeks later the 18 women who had responded to the pre-test received a second questionnaire (post-test). Sixteen women completed the post-test questionnaire. Test-retest analysis was conducted to establish the reliability of the instrument. Correlation coefficients ranged from .79 to .99. and were significant at $p<.05$. Internal consistency reliability assessment using Cronbach's alpha was conducted for the pre-test survey. Item analysis of each subscale was performed. The assessment of internal consistency of the modified HBMS revealed an acceptable Cronbach's alpha of .88 with internal consistency reliabilities ranging from .69 to .87. The internal consistency reliability for breast cancer knowledge scale (11 items) was .70. The acculturation scale consisted of 7 items with two sub-scales to measure constructs of language use preferences (3 items) and social network preferences (4 items). The internal consistency reliabilities was .74 and .80 for each subscale. The Cronbach's alpha for the combination of two sub-scales was .84. The social support scale had three sub-scales to assess support from husband/partner, families and friends for BSE, CBE and mammogram.

The internal consistency reliabilities for each sub-scale ranged from .82 to .96 and the Cronbach's alpha for the combination of the three sub-scales was .90.

In order to provide broad socioeconomic participation, the investigator contacted several community centers, cultural centers, Farsi schools, women's groups, community affiliated- service organizations, and local mosques in California and requested that the goal and importance of the research be described through community newsletters, email list serves, public announcements and social networking. An invitation to participate in the study was also posted on a popular Persian news website and was updated periodically. To recruit participants the purpose and significance of the research was explained during monthly meetings , seminars and informal gatherings. Although the investigator was not permitted access to the directory of any of the organizations, permission to recruit and distribute the surveys during organizational activities was requested and obtained from the directors of the organizations. Public housing and student housing services were also contacted and the investigator posted announcements in their facilities. Women who resided in public housing and contacted the investigator were designated a day for completing the survey. The investigator visited the women and administered the survey in person. Several special

events such as the Iranian Women's day, Mother's day and religious celebrations were held during the data collection period. The investigator attended all these special events and recruited subjects.

By surveying a variety of groups and multiple settings, the researcher intended to increase the diversity of the women participants in terms of age, education, and income. Upon recruitment each participant received a questionnaire package in the language of their choice (English or Farsi) containing a cover letter with information pertaining to the study, an informed consent document, the Breast Health Questionnaire and an informational booklet on breast cancer screening. All participants received an informational booklet titled, "Breast Health; What every women should know", donated by the Susan G. Komen Breast Cancer Foundation. This booklet was designed to provide general information about common breast changes, breast cancer risks and options for breast cancer screening and treatment.

Each participant was asked to complete the BHQ and return the survey to either the researcher or the contact person. In order to increase on site response rate participants who completed and returned the survey immediately received a complimentary free T-shirt donated by the American Cancer Society and the Susan G. Komen Breast Cancer Foundation. Data was collected over a three

month period from August 25th to November 30th, 2003 . This extended time of collection was to encourage greater participation in the study. Survey data was entered using SPSS, and was analyzed using descriptive univariate frequencies and bivariate cross tabulations. The Chi square statistic was used to test the significance of bivariate cross-tabulations at α=.05.

All survey data were entered and analyzed using the Statistical Package for Social Science (SPSS 11.5). Initial quantitative analysis began with descriptive analysis including frequencies for variables of interest in order to provide an overview of the study sample and their breast cancer screening behaviors. Data analysis also included univariate and bivariate methods, including chi square tests for cross tabulations.

Results

Five hundred and twenty (520) surveys were distributed to potential participants over a three month period from August 25th to November 30th, 2003. A total of 361 surveys were returned, yielding in a 69.4 % completion rate. Eleven surveys were excluded from the analysis because 8 women did not meet the age criterion and 3 women were not residents of California . Nine cases were deleted with missing data exceeding 10%. Therefore, 341 surveys were included in the analysis.

Participants in this study were Iranian immigrant women ages 30 and older living in California. Women ranged in age from 30 to 75 years. The mean age was 44 years with 27.9% of the women in the 40-45 age category. About 31.1% of the women were under 40 and 24.1% were 50 years of age or older. All participants were immigrants, with a mean length of residence in the United States of 16 years. Ranging from one year to more than 50 years (see Table 1).

Table 1. Participants Time in US Residency (measured in years)

N= 341	Mean + SD	Range
Years in USA	16.24+ 8.5	1-50

Over 68 percent (68.3%)of the respondents were married. Twelve percent of the women were never married and 19.4% were widowed, separated or divorced. Many of the respondents had completed college education (65.7%). Thirty four percent had earned a bachelor degree,18.8% had master's degrees and 7.3% had doctoral degrees.

Table 2. Demographic Characteristics

N= 341	n	% of Sample
Age (years)		
30-35	71	20.8
36-39	35	10.3
40-45	95	27.9
46-49	58	17.0
50-55	30	8.8
56+	52	15.3
Marital Status		
Married	233	68.3
Widowed	16	4.7
Divorced/separated	50	14.7
Never married	42	12.3
Education Level		
Less than high school	12	3.6
Completed high school	37	10.9
Some college	68	19.9
College and above	224	65.7
Employment Status		
Currently Unemployed	61	17.9
Currently Employed	219	64.2
Homemaker	47	13.8
Retired	14	4.1
Yearly Household Income		
LESS THAN $10,000	30	8.8
$ 10,000 TO $ 19,999	12	3.5
$ 20,000 TO $ 29,999	34	10.0
$ 30,000 TO $ 39,999	37	10.9
$ 40,000 TO $ 49,999	47	13.8
$ 50,000 TO $ 74,999	38	11.1
$ 75,000 TO $ 99,999	47	13.8
$100,000 AND OVER	64	18.8

Table 2. (Continued) Demographic Characteristics

N= 341	n	% of Sample
Health Insurance		
Yes	295	86.5
No	46	13.5
Regular primary Health Care Provider		
Yes	293	85.9
No	48	14.1
Gender of primary health Care Provider		
Male	164	48.1
Female	158	46.3
NA	19	5.6
Prior experience of breast abnormality		
Unusual breast condition	40	11.7
Abnormal mammogram	21	6.2
Both	75	22.0
No	205	60.1
History of Breast Cancer		
Yes	25	7.3
No	316	92.7
Family/friend with Breast Cancer		
Yes	128	37.5
No	213	62.5

Sixty four percent of the women were currently employed and 13.8% were full time home-makers. Among those that disclosed their annual family income 18.8% reported earning more than $100,000. More than thirteen percent (13.8%) reported earning between $75,000-$99,999. The Median income was $69,000, but 8.8% also reported earning less than $10,000.

The majority of the women were insured (86.5%) and 85.9% reported that they had a regular primary health care provider. Forty (11.7%) had a prior experience with unusual breast symptoms, and 6.2% had received an abnormal mammogram. Twenty two percent reported experiencing both. More than half of the women (60.1%) had no prior experience with any unusual symptoms and/or an abnormal mammogram. Approximately 7.3% of the women had been diagnosed with breast cancer. Among the respondents 37.5% reported knowing a relative or a close friend who had been diagnosed with breast cancer.

Breast Cancer Detection and screening knowledge

Responses to statements assessing levels of breast cancer screening knowledge are reported in Table 3. The percentages of correct responses to the women's knowledge of breast cancer detection and screening practices are displayed.

Table 3. Immigrant Iranian women's Breast Cancer detection and screening knowledge

Item	Correct Answer (%)
Breast cancer detection and screening knowledge	
How most breast lumps are found	53.0
Age women should start BSE	32.6
How often should perform BSE	55.1
Correct method for BSE	32.3
Abnormal breast change	67.2
Regular BSE is an effective method	83.0
Time of month BSE should be performed	54.0
Correct method for BSE (mirror)	55.1
Nipple discharge during BSE	50.7
Correct method for BSE (under arm)	74.5
Mammography is an effective method	82.4
Mammography is an addition to CBE and BSE	72.4
Age for Mammography	73.3

The majority of the respondents identified BSE as an effective method of breast cancer detection (83%). Only 67.2% knew signs/symptoms of breast cancer. A common misconception identified in this population was in the area of BSE practice. No more than 53 % knew that most lumps were found by women themselves. Most of the women did not know the age a woman should perform BSE and in response to the question "what age a woman should begin BSE", only 32.6% marked the correct age (20). Although 91.2% of the women reported knowing how to perform BSE, only 32.3% knew correct

method of performing BSE. More than 55.0% of the women surveyed did not know that BSE should be performed monthly and only 54% knew that BSE should not be performed during menstruation. As few as 50% of the women considered nipple discharge abnormal during BSE. There was a significant association between breast cancer knowledge and ever performed BSE (P<.000) and ever having had a CBE (P<.000).

There were fewer knowledge deficiencies found in the area of mammography. Among the women 94.4% had heard of mammography, and more than 82% of the respondents considered mammography an effective method for detecting lumps that can't be felt. Most respondents (72.4%) recognized that women without breast cancer symptoms and women who examine their breasts monthly still need to have mammograms. In addition, 73.3% of the respondents correctly stated that women age 40 and older should begin having mammograms. There was not a very strong association between knowledge of breast cancer and ever receiving a mammogram(P<.04).

Beliefs about breast cancer

The Iranian immigrant women's attitudes and beliefs regarding breast cancer and screening behaviors were assessed using questions from the Champion's Health Belief Model Scale (Champion, 1993). Perceived severity of breast cancer was assessed with six separate

questions. In general, the respondents rated breast cancer as very severe. Moderate to high levels of fear about breast cancer were present ; 78% agreed that the concept of breast cancer scared them and 60.4% were afraid to think about breast cancer (Table 4). More than half of the women agreed with the statement that "breast cancer would change my whole life", and 63.6% thought the problems with breast cancer would last a long time. About 41% of the women considered breast cancer as a threat to their relationship with their partner and more than 39% of the respondents disagreed with this statement. Only 17.3% agreed, " if they developed breast cancer they would not live longer than five years", 64% disagreed with this statement and 64% were neutral. Many of the women noted they did not feel comfortable responding to such a statement and felt that it was unrealistic. Responses to severity statement, was associated with ever performing BSE ($P<.01$) and ever having had a CBE ($P<.001$). Women who perceived breast cancer as serious were more likely to have ever performed BSE and have ever had CBE. Responses to severity questions were not found to be associated with ever having had a mammogram.

Table 4. Beliefs About Breast Cancer

N=341	Disagree	Neutral	Agree
Statement	N(%)	N(%)	N(%)
The thought of breast cancer scares me.	30(8.8)	45(13.2)	266(78)
I am afraid to think about cancer.	66(19.4)	69(20.2)	206(60.4)
Problems I would experience with breast cancer would last a long time.	59(17.3)	65(19.1)	217(63.6)
Breast cancer would threaten a relationship with my partner.	134(39.3)	67(19.6)	140(41)
If I had breast cancer my whole life would change.	64(18.4)	55(16.1)	222(65.1)
If I developed breast cancer, I would not live longer than 5 years.	218(63.9)	64(18.8)	59(17.3)

Motivation to engage in health-promoting behaviors was assessed with six questions. The majority of the women (92.2%) indicated their motivation to "discover health problems early", "importance of maintaining good health". Among the women, 82.4% were eager to search for new information to improve their health and 70.4% said they eat well balanced meals. Having regular check ups was important to 64% of the women, but only 52.2% said they exercised regularly. Motivation was significantly associated with ever having performed a BSE (P<.000), ever having had a CBE and a mammogram (P<.001).

Regarding Perceived benefits of breast cancer screening, 71% agreed that performing a BSE and a mammogram made them feel good about themselves, and 64% felt the same about having a CBE.

A large majority (86.3%) believed that having a mammogram will help find lumps early. More than 82% endorsed the same belief for CBE, and 78% for BSE. Although, 62% of the women thought receiving a CBE and a mammogram will make them worry less about breast cancer, only 58.6% thought the same about BSE. Over 62% of the women agreed that BSE, CBE and mammography will decrease their chances of requiring radical or disfiguring surgery if breast cancer occurs. There was a strong association between perceived benefits of BSE and ever having had a BSE ($P<.000$). Women who perceived BSE as beneficial were more likely to perform BSE. The relationship between perceived benefits of CBE and ever having received a CBE was also significant ($p<.001$). Finally, there was not a strong relationship between perceived benefits for mammogram and ever having received a mammogram.

Perceived barriers to BSE, CBE and mammography were also evaluated. The majority of the respondents (73.7%) of the respondents disagreed that BSE, CBE and mammography is embarrassing. Only 64.3% of the respondents disagreed with the statement, "performing

BSE will be unpleasant", and 82.4% disagreed with the statement, "I don't have enough privacy to perform a BSE".

Over sixty eight percent of the women did not perceive CBE to be painful. More than 71% of the women did not perceive CBE or mammography to take too much time and 67.7% of the respondents disagreed that a CBE and a mammogram would cost too much money. There was a significant association between between higher perceived barriers and ever having a BSE ($P<.035$) and ever receiving a mammogram ($P<.000$).

Only 44.9% of the respondents rated themselves as confident that they could perform BSE correctly. Confidence in performing BSE was strongly associated with ever having performed BSE ($P<.01$).

Provider Experiences

Forty eight percent reported seeing a male physician and 46.3% had a female physician. The participants were asked about the language in which they communicated with their physician, 68.9% reported communicating in English; 24% used Persian (Farsi) and 2.6% other languages such as (Armenian and Turkish) to communicate with their physician. Among the women who reported never having performed BSE, 59.6% had English- speaking physicians, and 25.5% had (Persian)Farsi- speaking physicians. Almost, 52% of

the doctors who did not teach BSE were English- speaking, and 34.6% were Farsi- speaking.

The women who had ever performed BSE (P<.01), ever had a CBE (P<.000) and a mammogram (P<.001) tended to have stayed in the United States longer than 10 years. An Iranian immigrant woman was also more likely to ever have had a CBE(P<.01) if she had health insurance (Table 5). There was not a significant association between having insurance and ever having performed a BSE and ever having had a mammography . A woman was more likely to ever have received a CBE (P<.001) and a mammogram (P<.001) if she had a health care provider whom she visited regularly.

Table 5. Access to Health Care and Ever Having a BSE, CBE and Mammogram

	Ever had BSE	Ever had CBE	Ever had mammogram
	N(%)	N(%)	N(%)
Health insurance			
Yes	258(87.8)	278(87.7)	225(88.6)
No	36(12.2)	39(12.3)	29(11.4)
Regular Doctor			
Yes	259(88.1)	278(87.7)	224(88.2)
No	35(11.9)	39(12.3)	30(11.8)

A large proportion of women (84.8%) stated that they had been taught how to perform BSE by a health care provider. A woman was more likely to have ever performed a BSE if a physician or health care provider taught her (P<.000).

Among women who were taught how to perform BSE 5.9% reported never having performed a BSE compare to 57.7% who were not taught BSE and never performed BSE (see Table 6).

Table 6. Physician Taught BSE and BSE Practice

		Ever performed BSE		
		Yes	No	Total
Physician taught BSE	Yes	272	17	289
	No	22	30	52
		294	47	341

*Chi –square test of significance at alpha-.05.

With regard to CBE, 93.0% reported having had a CBE by a health care provider at least once. Only 5.6% reported they had never heard of a mammogram. Three hundred and twenty two (94.4%) had heard of mammography and two hundred and fifty four (74.5%) received a mammogram recommendation by their physician. Receipt of a baseline mammogram was significantly more likely if a physician or health care provider recommended it (P<0.000). Of the women who

reportedly received a physician recommendation, 93.3% had had a mammogram compared with only 19.5% for the women who had not received a recommendation. In addition, among women who had not received a recommendation 80.5% had not had a mammogram, compared to 6.7% who had had a recommendation (see Table 7).

Table 7. Physician Recommended Mammography And Mammography Practice

		Ever had mammogram		
		Yes	No	Total
Physician recommended mammogram	Yes	237 93.3%	17 19.5%	254 74.5%
	No	17 6.7%	70 80.5%	87 25.5%
		254	87	341

*Chi –square test of significance at alpha-.05.

Profile of Breast Cancer Screening Behaviors

Details of the breast cancer screening behaviors of immigrant Iranian women are presented in Table 8.

Three hundred and eleven (91.2%)of the respondents reported knowing how to perform BSE, and (86.2%) had practiced BSE at least once. Among the respondents, 93% reported having received at least one CBE. Two hundred and fifty four (74.4%) reported having had a mammogram at least once. Nineteen women (5.6%)reported they had

never heard of a mammogram. Two hundred and three women (59.5%) stated "routine checkup", and 13.2%, "follow up to a problem" as the reason for their most recent mammogram.

Table 8. Immigrant Iranian women's breast cancer screening behaviors (N=341)

Screening Behavior	n	% of sample
BSE		
Know how to Perform		
Yes	311	91.2
No	30	8.8
Ever performed		
Yes	294	86.2
No	47	13.8
CBE		
Ever had		
Yes	317	93.0
No	24	7.0
Mammogram		
Ever had		
Yes	254	74.5
No	87	25.5

Since ever having received or practiced a screening behavior does not ensure adequate screening frequency, women were also asked about the frequency of their screening behaviors based on the ACS guidelines. The ACS guidelines call for (ACS, 2003) monthly breast self-exam for women aged 20 and over, clinical breast exams for women aged 20-39, every 3 years. Yearly clinical breast exams

and mammography for women over 40. Table 9 includes a summary of frequency of the respondent's breast cancer screening behaviors and Table 10 shows patterns of breast cancer screening practices by age among immigrant Iranian women by age-specific categories.

Table 9. Frequency Of Immigrant Iranian Women's Breast Cancer Screening Behaviors (N=341)

Screening Behavior	n	% of sample
BSE Frequency		
Once a month	130	38.1
Once every two months	26	7.6
Once every three months	58	17.0
Once every six months	34	9.9
Once a year	30	8.9
Not at all	63	18.5
CBE Frequency		
Every year	241	70.7
Every two years	46	13.5
Every three years	29	8.5
None	24	7.3
Mammogram Frequency		
Less than one year ago	148	43.4
One year ago	73	21.4
More than two years ago	26	7.6
Not at all	87	25.5

Only one hundred thirty (38.1%) participants practiced BSE once a month, 26 (7.6%) practiced BSE once every two months, 58 (17.0%) practiced BSE once every three months, 34 (9.9%) practiced BSE once every six months, 30 (8.9%) practiced BSE once every year. Sixty three (18.5%) of the participants reported that they never practice BSE. A comparison across age specific categories showed younger women were slightly less likely to have ever performed BSE.

With regards to CBE, two hundred and forty one (70.7%) participants reported having yearly CBE. Of those receiving a CBE little difference was seen by age group. Forty six (13.5%) reported getting a CBE every two years and 29 (8.5%) reported getting a CBE every 4 years. About 7.3% of the participants reported they had never had a CBE.

As seen in Table 10, 55.6% of the women aged 40 years and older had a mammography less than a year ago; 25.6% reported having received mammography a year ago and ; 9.4% received one more than two years ago. Among women age 40 and older, 7.7% reported never having a mammogram.

Table 10. Patterns of breast cancer screening practices by age among immigrant Iranian women by age-specific categories

	30-35	36-39	40-45	46-50	51 and up
	n=72	n=35	n=94	n=58	n=82
	n(%)	n(%)	n(%)	n(%)	n(%)
BSE(n=341)					
Ever performed*	58(80.6)	33(94.3)	85(90.4)	49(84.5)	69(84.1)
Performed every month	29(40.3)	9(25.7)	35(37.2)	24(41.4)	33(40.2)
CBE (n=341)					
Ever had*	60(83.3)	33(94.2)	92(97.8)	54(93.1)	78(95.1)
Receive every year*	47(65.3)	23(65.7)	67(71.3)	41(70.7)	63(76.8)
Received every 2-3 years	7(9.7)	4(11.4)	16(17.0)	9(15.5)	10(12.2)
Mamography(n=234)***					
Ever had***			88(93.6)	55(94.8)	74(90.2)
Received in less than a year ≤12			48(51.1)	40(69.0)	42(51.2)
Received 1 year ago			28(29.8)	10(17.2)	22(26.9)
Received more than 2 years ago			10(10.6)	5(8.6)	7(8.5)
Never had a mammogram			6(6.4)	3(5.2)	9(10.9)

*Chi –square test of significance at alpha =0.05.

Discussion

Studies of racial and ethnic subgroups made up of mainly immigrants show they have lower screening rates for breast cancer (Maxwell et al., 2000;Tu et al., 2000;Taylor et al., 1999). One of the challenges for the 21st century is to meet Healthy People's 2010 goals of increasing early breast cancer detection and reducing breast cancer

mortality among multicultural and racial and ethnic minority women in United States.

There are no published studies on breast cancer screening behaviors of immigrant Iranian women in United States. This study was an initial attempt to obtain descriptive information about breast cancer screening practices of Iranian immigrant women in United States, and to provide preliminarily baseline data for future studies. The purpose of this study was to examine; Iranian immigrant women's knowledge, beliefs and attitudes towards breast cancer, and explore their breast cancer screening behaviors.

With regards to positive perceptions regarding breast cancer screening, Iranian immigrant women understood the importance of breast cancer screening. The women perceived breast cancer as serious and, also believed that they could have control over their own health and were motivated to be healthy.

In this study nearly all participants had heard of mammography (94.1%), among women ages 40 and up, 7.7% of the had never had a mammogram. For women ages 40 and up 55.5% had a mammogram less than a year ago and 25.6% of the women had a mammogram one year ago. Therefore, total of 81.1% of the women aged 40 and up reported having a mammogram less than two years ago, and 9.4% of the women reported having undergone mammography more than two

years ago. Routine screening was the reason for obtaining a recent mammogram for 59.5% of the women. Two hundred and fifty four (74.5%) received a mammogram recommendation by their Physician. Of the women who reportedly received a physician recommendation 93.3% had at least one mammogram compared with only 6.7% for the women who did not receive a recommendation.

The majority (93%) of the women indicated having had at least one CBE. Seventy three percent (73%) of the participants ages 40 and up reported having had a CBE every year. Among women below the age of 40, 65.4% reported having a CBE every year and 10.3% having a CBE every two to three years.

This higher than average reported screening rate for mammography and CBE may reflect the unique circumstances of Iranian immigrant women in this sample. Many of the respondents had completed college education (65.7%). Thirty four percent had earned a bachelor degree,18.8% had master's degrees and 7.3% had doctoral degrees. Sixty four percent of the women were currently employed and worked outside the home . Education and training may have led to employment positions with higher wages. Among those that disclosed their annual family income 18.8% reported earning more than $100,000. More than thirteen percent (13.8%)

reported earning between $75,000-$99,999 with the median income being $69,000. As a result the majority of the women reported having health coverage (86.5%) and 85.9% reported that they had a regular primary health care provider This factors have repeatedly shown to positively influence women's adherence to screening guidelines. Women who did not have health coverage and did not see a primary health care provider on a regular basis were less likely to comply with CBE and mammography screening guidelines. These women are more likely to be new or undocumented immigrants (Borrayo and Guarancia, 2000).

A total of 86.2% of the women had practiced BSE at least once , and 84.8% stated that they had been taught how to perform BSE by a health care provider. Being taught how to do BSE was strongly associated ($P<0.001$) with a higher likelihood of ever having performed BSE (92.5% versus 7.5%). Only 38.1% participants practiced BSE once a month and 18.5% reported not practice at all. The comparatively lower BSE rates are in contrast with the higher annual CBE and mammography rates. This could be due to women placing lower priority on this method of screening and therefore lack of adequate knowledge about BSE as reflected in the breast cancer screening knowledge scores. Although 84.8 % indicated that they were taught how to perform a BSE by a health care provider, the assessment of BSE

knowledge revealed insufficient BSE skills and knowledge in this group. For example, only 32.6% knew the correct age a woman should begin BSE and, only 32.3% knew correct method of performing BSE. More than 55.0% of the women surveyed did not know that BSE should be performed monthly and only 54% knew that BSE should not be performed during menstruation. They also had difficulty differentiating normal and abnormal breast symptoms. For example, half of the women considered nipple discharge normal during BSE.

This reconfirms the importance of knowledge as an influential factor in breast cancer screening behaviors. As stated in several studies women who had knowledge of the correct method and time to perform BSE were more likely perform BSE on a consistent bases. Lack of confidence in performing BSE has also been identified as a barrier to BSE . In this study only 44.9% of the women rated themselves as confident that they could perform BSE correctly. The significance of confidence related to BSE performance is consistent with results of other studies (Champion and Menon , 1997; Smiley et al., 2000).

While the findings reported in this study are encouraging, there are certain limitations. The most important was the use of a convenience sample of immigrant Iranian women in California. Therefore findings may not be generalizable to the broader population of immigrant Iranian women in the US. As there are no published reports

on screening practices of Iranian women in United States and national surveys do not specify screening rates for this population, it is not possible to compare our findings with other Iranian women living elsewhere in the United States.

Second, these data came from self-reports and were subject to recall and desirability response bias. Because of the tendency of the subjects to answer questions the way they think is preferred frequency of breast cancer screening practices may have been overestimated.

Some of the strengths of the study include the common culture shared by the investigator and the study participants. Shared culture and language and use of a Persian version of the questionnaire facilitated the quality of data collection which resulted in a high (69.4%) response rate. Another strength is that this study is the first of its kind to explore Iranian immigrant women's breast health issues, an understudied population in terms of health promotion and disease prevention efforts. This information will in turn provide suggestions for more focused ethnic specific health promotion programs to increase breast cancer screening behavior among this population.

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ARTICLE 2: PREDICTORS OF BREAST CANCER SCREENING AMONG IMMIGRANT IRANIAN WOMEN IN CALIFORNIA

Abstract

This study examined the predictors of age-specific breast cancer screening participation among immigrant Iranian women ages 30 and up. Predictor variables included socio-demographic variables, health beliefs about breast cancer and screening, breast cancer screening knowledge and acculturation concepts. Socio-demographic variables included age, marital status, length of stay in United states, family income, education, employment, insurance coverage, having a regular source of care, physician's gender, and language used in communicating with physicians. Clinical variables included prior experience of breast abnormalities, family/friend with breast cancer, and a personal history of breast cancer. Logistic regression was used to identify predictors of women's breast cancer screening. The logistic regression results appear as odds ratios (ORs) and 95% confidence intervals. Logistic regression using the method of likelihood estimation was conducted to identify the most important predictors after adjusting for other variables (P>.05 for removal from model). Multivariate Logistic analysis indicated women with college degree or higher, better knowledge of breast cancer (OR= 4.74), P<.001), with high health motivation (OR= 4.77, P<.001) and those who were taught

by a physician how to perform breast self-examination (OR=19.14, P=.000) were more likely to have ever performed BSE. Older women were less likely to have ever had a CBE (OR=.178, P<.004). Those who lived in the United States for more than 10 years (OR=5.24, P<.004) with prior experience of breast abnormality (OR=7.95, P<.008) who had better knowledge of breast cancer, perceived higher benefits for CBE and if health motivated were more likely to have ever had a CBE. Women who lived in the United States for more than 10 years ((OR= 6.97 P<.007), were recommended by their physician to have a mammogram (OR= 22.6, P=.000), communicated with their physician in English (OR=5.11, P<.015) and had prior experience with breast abnormalities (OR= 22.6, P<.009) were more likely to have ever had a mammogram. Bilingual women (OR=2.74, P<.002) with prior experience of breast abnormality (OR= 4.70 P<.000) and higher health motivation (OR=3.08, P<.000) were more likely to practice BSE monthly. Bilingual women between 30-39 years of age (OR= 12.80, P<.011), with higher perceived benefits (OR= 10.04, P<.006), and health motivation (OR= 7.45, P<.018) were more likely to be compliant with CBE guidelines. For women 40 years of age and older other factors such as employment and physician's gender were also significant. Those who were employed (OR= 2.12, P<.040), had a male physician (OR= 2.72, P<.006), with high

perceived benefits(OR= 2.21, P<.05) and health motivation(OR= 3.46, P=.000) were more likely to have annual CBE .Women 40 and older who had a regular health-care provider (OR=3.20, P<.032), were recommended by their physician to have a mammogram (OR= 4.45, P<.038), and spoke in English with their provider (OR= 3.50, P<.005) were more likely to be have annual mammograms . In general, the screening rates for CBE and mammography among the participants in the current study were higher than levels set in the year 2010 Health Objectives and those reported for women nationally. These findings are inconsistent with previous studies on immigrant women living in the United States which indicate low rates of screening compared with the predominantly white populations and even lower rates of screening among first generation immigrants.

Introduction

Breast cancer is the second leading cause of cancer death in women, exceeded only by lung cancer. According to the American Cancer Society (ACS) in 2004, approximately 215,990 and in 2005, 211,240 women in the United States will be diagnosed with invasive breast cancer (ACS, 2005). It is estimated that 40,410 women will die from breast cancer in the United States this year (ACS,2005). It is estimated that 40,110 women will die from breast cancer in the

United States this year. The incidence rate of breast cancer (number of new breast cancers per 100,000 women) increased by approximately 4% during the 1980s but leveled off to 100.6 cases per 100,000 women in the 1990s. The death rates from breast cancer also declined significantly between 1992 and 1996, with the largest decreases among younger women. Medical experts attribute the decline in breast cancer deaths to earlier detection and more effective treatments. Breast cancer incidence increases with age. About 77% of women with breast cancer are over age 50 at the time of diagnosis. Women between the ages of 20 and 29 account for only 0.3% of breast cancer cases (ACS, 2004). Although significant progress has been made in identifying risk factors and genetic markers, more than 50% of cases occur in women without known major predictors (ACS, 2003).

Numerous studies have shown that early detection saves lives and increases a woman's choice in treatment options. Early detection can identify breast abnormalities that may be cancer in an early stage. The results from the 2000 National health Interview Survey indicated that although screening use for most groups has increased since 1987, no significant improvements have been observed for the groups with greatest needs, therefore, major disparities remain. Minority groups, particularly uninsured individuals and those with no usual source of

care are falling further behind. Recent immigrants also experience a significant gap in screening utilization. For example, women with no usual source of health care , no health insurance, and women who had migrated to the United States within the last 10 years were least likely to have had a mammogram within the last 2 years (Swan, et al., 2003).

Various studies have also demonstrated that both breast cancer knowledge and beliefs about breast cancer and its prevention have emerged as important variables in predicting breast cancer screening behavior (Maxwell et al., 1998; Beaulieu et al., 1996; Aiken et al., 1994; Harlan & Bernstein, 1991; Jenkins et al., 1990). Claiming that underutilization of screening is mainly due to lack of knowledge, belief systems and attitudinal factors. Researchers have paid little attention to variations within different ethnic groups, even though diverse groups have cultural and personality profiles that place them at risk in different ways. Very few studies have explored screening behaviors of first generation immigrant women, specifically in terms of knowledge, attitudes and behaviors towards breast cancer screening. Preventive health behavior is not homogenous and while the migration experience itself is mediated by gender and age, it is influenced by the changes in socio-economic status, the changes in social networks, and the changes in culture (Rogler, 1994). These

women's subjective interpretation of their daily life and evaluation of their migration experience is influenced by their pre-migration experiences and cultural frameworks.

Therefore, to better understand Iranian immigrant women's health seeking behaviors, it must be contextualized within the socio-cultural and historical context of their migration and settlement, the cultural disparity between the home and host culture, the individual's personal interpretation of disease, as well as the host country's portrayal of them (Rajaram and Rashidi, 1998).

Experiences and screening behaviors of Iranian immigrant women might be quite distinct and different from ethnic groups and cultures that have been previously studied. This supports the need to investigate screening behaviors and factors that are specific to this population and to understand racial and ethnic differences that influence breast cancer screening practices. This study is also unique because of its target population, as it pertains to popular western culture's depiction of Middle Eastern women. In spite of their social, cultural and ethnic differences, Middle Eastern women are frequently portrayed homogeneously which reinforces stereotypes, marginalization, and racial and gender biases. This is generally true in the case of Iranian women since their post-revolutionary national image in the minds of the West is a homogeneous picture of veiled submission.

The purpose of this study was to explore breast cancer screening behaviors and to determine key factors that may predict breast cancer screening among immigrant Iranian women for the first time. Research regarding breast cancer screening behaviors of Middle Eastern women remains very limited and studies about breast cancer screening behaviors of Iranian immigrant women are non-existent. The present study is the first attempt to address this research gap.

Background Literature

Profile of Iranian immigrants in the U.S

Three waves of Iranian immigration to United States have been described. The first wave begins after World War II until 1978 and consisted mostly of students from the social elite .These immigrants mainly came for educational and economical opportunities. The second wave (1978) began after the political turmoil in Iran in 1978 and the eight year Iran-Iraq war when sociopolitical and economic conditions deteriorated. This wave included many refugees and immigrants from government officials, religious minorities and wealthy families. The third wave included a large number of political activists who sought asylum and family members of previous immigrants (Ansari, 1992).

Iranians are perhaps the least understood and well-known of any ethnic group in the United States. The US census estimates that Iranian American community numbers around 330,000, with the largest community of Iranian descent residing in California. However, according to research by the Iranian Studies Group, at Massachusetts Institute of Technology (MIT) Iranian-Americans are far more numerous in the United States than census data indicate. There are estimates that the actual number of Iranian-Americans may top 691,000 to 1,000,000(Fost, 1990; ISG MIT, 2005).

Overall census counts of Iranian-Americans may be low in part because many people are reluctant to identify their country of origin due to troubled relations between the United States and Iran over the past 25 years. In addition the US census does not offer a designation for Individuals of Iranian descent. As a result only a fraction of the total number of Iranians in the United States, choose to write in "Iranian" as their ancestry, underestimating the size and importance of the Iranians living in United States.

While several reports by the Center for Immigration studies (2000) on the soci-economic status of Iranian immigrants in the US suggest that 60.9% of Iranians have college degrees, with an average annual income of $60,000 and 69.3% home ownership (Center for Immigration Studies, 2000). Their success, however, has not resolved

the difficulties they face as individuals and as a group of immigrants living in the United States. These problems include stereotyping, invisibility, harassment and discrimination.

Overall, the Iranian community in the U.S. has been under stress ever since the 1979 Islamic revolution and hostage crisis in Iran in addition to the alarming number of reports of discrimination and racial profiling post-9/11.

Methods

Sample and Setting

The study design was a cross-sectional survey. The participants in this study consisted of self-identified first generation immigrant Iranian women who were born and/or lived in Iran before they migrated to the United States (N=341). Study participants inclusion criteria included: a) Iranian women between the ages of 30-80 years who lived in California, b) Iranian women able to read and speak English and /or Farsi.

Instrument

The data were obtained using the Breast Health Questionnaire (BHQ). The BHQ was developed by the investigator. This instrument was designed using a selection of questions from the Champion's Health Belief Model Scale (HBMS), the Breast Cancer Knowledge Test

(BCKT; McCance et al. 1990), and Marin's Acculturation scale (1987). The BHQ was a self-administered questionnaire, consisting of the following sections, 1)breast cancer screening behaviors profile, 2 breast cancer knowledge, 3)health belief's about breast cancer , 4) acculturation level and , 5) socio-demographic information. The last question provided a space for any additional comments the participants might have. The questionnaire was combined into a booklet and translated into Farsi, using the method of back-translation. Participants needed approximately 15-17 minutes to complete the questionnaire.

Data Collection

Face and content validity of the instrument were evaluated by seven experts in the fields of public health, nursing, and medical anthropology. In order to ensure the cultural sensitivity of the instrument the panel of experts was asked to rate the items for wording, relevancy, importance and cultural sensitivity. Length and the clarity of the questionnaire was also considered.

Prior to the pilot study approval was obtained from the Oregon State University Institutional Review Board. Twenty women who met the inclusion criteria were recruited and asked to participate in the

pilot study. Through both a cover letter and verbal instruction the participants were informed about the purpose of the study, the procedures and that their participation was voluntary and their responses would remain confidential.

The test-retest method was used to assess the reliability of the instrument. A pre-test questionnaire was given to all 20 women. From the twenty women eighteen completed and returned the pretest questionnaire. Two weeks later the 18 women who had responded to the pre-test received a second questionnaire (post-test). Sixteen women completed the post-test questionnaire. Test-retest reliabilities using Pearson correlation coefficients ranged from .79 to .99 and were significant at $p<.05$.

Internal consistency reliability assessment using Cronbach's alpha was conducted for the pre-test survey. The assessment of internal consistency of the modified HBMS revealed an acceptable Cronbach's alpha of .88 with internal consistency reliabilities ranging from .69 to .87. The internal consistency reliability for breast cancer knowledge scale (11 items) was .70. The acculturation scale consisted of 7 items with two sub-scales to measure constructs of language use preferences (3 items) and social network preferences (4 items). The internal consistency reliabilities was .74 and .80 for each

subscale. The Cronbach's alpha for the combination of two sub-scales was .84.

In order to provide broad socioeconomic participation, the investigator contacted several community centers, cultural centers, Farsi schools, women's groups, community affiliated- service organizations, and local mosques in California and requested that the goal and importance of the research be described through community newsletters, email list serves, public announcements and social networking. An invitation to participate in the study was also posted on a popular Persian news website and was updated periodically. To recruit participants the investigator attended monthly meetings , seminars and informal gatherings to explain the purpose and significance of the research. Several special events such as the Iranian Women's day, Mother's day and religious celebrations were held during the data collection period. Recruitment of subjects took place at all these special events. By surveying a variety of groups and in multiple settings the diversity of the women participants in terms of age, education, and income was expanded. Upon recruitment each participant received a questionnaire package in the language of their choice (English or Farsi) containing a cover letter with information pertaining to the study, an informed consent document, the Breast Health Questionnaire and an informational booklet on breast cancer

screening. All participants received an informational booklet titled, "Breast Health; What every women should know", donated by the Susan G. Komen Breast Cancer Foundation. This booklet was designed to provide general information about common breast changes, breast cancer risks and options for breast cancer screening and treatment. Each participant was asked to complete the BHQ and return the survey to either the researcher or the contact person. To increase on site response rates participants who completed and returned the survey immediately received a keep T-shirt donated by the American Cancer Society and the Susan G. Komen Breast Cancer Foundation for their voluntary participation.

Statistical Analysis

Statistical analysis was performed using SPSS version 11.0. Data analysis included the use of descriptive statistics, testing differences between means and logistic regression. Descriptive statistics was used to understand women's breast cancer screening behaviors, demographic characteristics, socioeconomic status, level of acculturation, and knowledge and beliefs about breast cancer. Testing differences between means was used to assess similarities and differences between women living in Northern and Southern California.

In this study the independent variables were health beliefs about breast cancer, breast cancer knowledge, health-professional

recommendation, socio-demographic variables and acculturation concepts. The dependent (criterion) variables were breast self-examination (BSE), clinical breast examination (CBE) and mammography. Each variable represented one of the recommended breast cancer early detection behaviors and was dichotomized into compliers and non-compliers. In order to be compliant the women had to follow ACS (2003) screening guidelines appropriate to their age. Logistic regression was used to predict a binary dependent variable from a set of independent variables. The logistic regression results appear as odds ratios (ORs) and 95% confidence intervals.

Backward stepwise multivariate logistic regression using the method of likelihood (-2LL) estimation was conducted to identify the most important predictors.

Results and Discussion

Five hundred and twenty surveys were distributed to potential participants over a three month period from August 25th to November 30th, 2003. A total of 361 surveys were returned, yielding a 69.4 % completion rate. Eleven surveys were excluded from the analysis because 8 women did not meet the age criterion and 3 women were not residents of California . Nine cases were deleted with missing data exceeding 10%. Therefore, 341 surveys were included in the analysis.

Socio-demographic characteristics

Participants in this study consisted of Iranian immigrant women ages 30 and older living in California. The mean age of study participants was 44 years (SD= 2.01) with a range in age of 30 to 75 years. With 27.6% of the women in the 40-45 age category . About 31.1% of the women were under 40 and 24.1% were 50 years of age or older. All participants were immigrants, with a mean length of residence in the United States of 16 years. Ranging from a year to more than 50 years. Over 68 percent (68.3%)of the respondents were married. Twelve percent of the women were never married and 19.4% were widowed, separated or divorced. Many of the respondents had completed college education (65.7%). Thirty four percent had bachelor degrees, 18.8% held masters, and 7.3% were educated at the doctoral level. Sixty four percent of the women were currently employed and 13.8% were full time home- makers. Among those that disclosed their annual family income 18.8% reported earning more than $100,000. More than thirteen percent (13.8%) reported earning between $75,000-$99,999. The Median income was $69,000, but 8.8% also reported earning less than $10,000.

The majority of the women were insured (86.5%) and 85.9% reported that they had a regular primary health care provider. Among the participants 11.7% had a prior experience with unusual breast

symptoms, and 6.2% had received an abnormal mammogram. Twenty two percent reported experiencing both. More than half of the women (60.1%) had no prior experience with any unusual symptoms and/or an abnormal mammogram. Approximately 7.3% of the women had been diagnosed with breast cancer. Among the respondents 37.5% reported knowing a relative or a close friend who had been diagnosed with breast cancer.

Breast Cancer Screening Profile

A total of 86.2% of the women had practiced BSE at least once , Only 38.1% practiced BSE once a month and 18.5% reported not practicing at all. The comparatively lower BSE rates are in contrast with the higher annual CBE and mammography rates. The majority (93%) of the women indicated having had at least one CBE. Seventy three percent (73%) of the participants ages 40 and up reported having had a CBE every year. Among women below the age of 40, 65.4% reported having a CBE every year and 10.3% having a CBE every two to three years. In this study nearly all participants had heard of mammography (94.1%), among women ages 40 and up, 7.7% never had a mammogram. For women ages 40 and up 55.5% had a mammogram less than a year ago and 25.6% of the women had a mammogram one

year ago. Therefore, a total of 81.1% of the women aged 40 and up reported having a mammogram within the last year, and 9.4% of the women reported having undergone mammography more than two years ago. Routine health screening visits to a health care provider was the reason for obtaining a recent mammogram for 59.5% of the women.

Predictors of Breast Cancer Screening

Both bivariate and multiple logistic regression analyses were used to explore factors influencing BSE, CBE , and mammography practice (ever had) and frequency (Compliance with ACS guidelines). The odds ratios for breast cancer screening practices are presented in Table 11.

Bivariate Analysis for Breast Cancer Screening Practice

BSE Practice

There were no significant bivariate relationships between age, employment, health insurance, a regular health care provider, language of communication with physician, prior experience of breast abnormality and ever performed BSE. Participants who were taught by a physician how to perform breast self-examination were more likely to have ever performed BSE (OR=21.8, P=.000). Women with knowledge about breast cancer screening (OR= 6.8), perceived seriousness (OR=2.14), perceived benefits (OR=3.51), with confidence in performing

BSE correctly (OR=2.4) and motivation to improve their health (OR=4.30) were more likely to have ever performed BSE. Women with higher perceived barriers (OR=.41) were less likely to have ever performed BSE. Women who received support from their husbands/partners, family and friends were more likely to have ever performed BSE.

CBE and Mammography Practice

There were no significant bivariate relationships between having a college education and perceived barriers and ever having had a CBE. Perceived seriousness (OR= 3.87, P<.003) and benefits (OR= 4.77, P<.001)were strongly associated with ever having had a CBE.

The results indicated that length of stay in the United States, employment, having a regular health care provider, language use in communication with physician, prior experience of breast abnormality, knowledge and health motivation were all common important predictors for ever having had a CBE and mammography. Women who received support from their husbands/partners and friends were more likely to have ever had CBE. Women who were recommended by their physician to get a mammogram were more likely to have ever had one (OR= 21.07, P=.000), and those who perceived higher barriers to mammography were less likely to have ever had a mammogram(OR=.121, P=.000).

Women with family support were also more likely to have ever had a mammography.

Multivariate Analysis for Breast Cancer Screening Practice

Table 12 summarizes the results of the multiple logistic regression analysis including the odds ratios and their corresponding confidence intervals for breast cancer screening practice.

The multivariate analysis indicated women with an AA college degree or higher, who were more knowledgeable about breast cancer (OR= 4.74, P<.001), and were health motivated (OR= 4.77, P<.001) and those who were taught by a physician how to perform breast self-examination (OR=19.14, P=.000) were more likely to have ever performed BSE. Women 40 years and older were less likely to have ever had a CBE (OR=.178, P<.004). Those who lived in the United States for more than 10 years (OR=5.24, P<.004) with prior experience of breast abnormality (OR=7.95, P<.008) were more likely to have ever had a CBE. Having a regular source of health care was not a very significant factor in the final model (OR=3.02, P<.092). Further more, those who had better knowledge of breast cancer, perceived higher benefits for CBE and were health motivated were more likely to have ever had a CBE. Women who lived in the United States for more than 10 years (OR= 6.97 P<.007), were recommended by their physician to have a mammogram (OR= 22.6, P=.000), communicated with their physician in

English (OR=5.11, P<.015) and had prior experience with breast abnormalities (OR= 22.6, P<.009) were more likely to have ever had a mammogram.

Bivariate Analysis for Breast Cancer Screening Compliance

BSE Compliance

The odds ratios and confidence intervals of the bivariate logisitic regression analysis are presented in Table 11. Women who were knowledgeable about breast with perceived the benefits of BSE, with motivation to improve their health were more likely to practice BSE monthly. Interestingly, participants who had higher than an AA degree were less likely to practice BSE monthly. Level of acculturation was a significant predictor of BSE compliance and bicultural women were more likely to practice BSE monthly.

Table 11. Bivariate Logistic Regression Model of Association Between Significant Variables and BSE, CBE and Mammography Practice

	BSE			CBE			Mammography(1)		
Variables	OR	P	CI	OR	P	CI	OR	P	CI
Age	ns	ns	ns	.297	.005	.127-.692	ns	ns	ns
Education	2.04	.025	1.09-3.78	ns	ns	ns	ns	ns	ns
Years in US	2.21	.018	1.14-4.27	6.86	.000	2.87-16.39	4.98	.002	1.81-13.69
Income	1.96	.034	1.05-3.67	2.57	.027	1.11-5.92	ns	ns	ns
Employment	ns	ns	ns	2.71	.021	1.17-6.30	3.93	.010	1.40-11.07
Health Insurance	ns	ns	ns	2.94	.025	1.14-7.53	ns	ns	ns
Regular Physician	ns	ns	ns	4.28	.001	1.75-10.43	5.80	.001	1.96-17.15
Physician Recommended(2)							21.07	.000	6.81-65.2
Physician taught breast self-exam(3)	21.82	.000	10.4-45.5						
Physician Language	ns	ns	ns	2.37	.043	1.03-5.47	4.24	.011	1.39-12.96
Experience of breast Abnormality	ns	ns	ns	5.06	.010	1.48-17.29	13.4	.012	1.75-102.1
Knowledge	6.8	.000	3.38-13.54	5.81	.000	2.24-15.05	3.03	.044	1.03-8.88
Seriousness	2.14	.017	1.15-3.99	3.87	.003	1.61-9.33	ns	ns	ns
Benefits	3.51	.000	1.84-6.69	4.77	.001	1.91-11.85	ns	ns	ns
Confidence*	2.378	.012	1.206-4.69						
Barriers	.410	.035	.178-.940	ns	ns	ns	.121	.000	.043-.341
Motivation	4.30	.000	2.11-8.78	5.61	.001	2.04-15.40	4.05	.008	1.44-11.4

1-Mammography for women 40 and up
2- Has a physician ever advised you to have a mammogram?
3-Has a doctor or health care provider taught you how to perform breast self-examination?
ns=not significant * only for BSE

Women with prior experience of breast abnormalities, and a history of breast cancer were more likely to be compliant. Interestingly, physician intervention (women whose physicians had taught them how to perform a BSE) was not a significant predictor of BSE compliance (P<. 104).

CBE compliance

Since the ACS guidelines for CBE differ for women below the age of 40 , a separate bivariate analysis was conducted for each specific age category. Perceived benefits of CBE and higher health motivation were important predictors of CBE compliance for both age categories. In addition, bilingual women, meaning those who read and speak both Farsi and English were more likely to be compliant.

For women ages 40 and older, income, employment, health insurance, having a regular health care provider, and physician's gender were also important predictors of regular CBE. Women who had male physicians were more likely to be compliant. Those who perceived higher barriers and specifically considered time a barrier were less likely to be CBE compliant.

Table 12. Multiple Logistic Regression Model of Association Between Significant Variables and BSE, CBE and Mammography Practice

	BSE			CBE			Mammography (1)		
Variables	OR	P	CI	OR	P	CI	OR	P	CI
Age	ns	ns	ns	.178	.004	.055-.058	ns	ns	ns
Education	2.35	.044	1.02-5.41	ns	ns	ns	ns	ns	ns
Years in US	ns	ns	ns	5.24	.004	1.70-16.12	6.97	.007	1.69-28.6
Regular Physician	ns	ns	ns	3.02	.092	.836-10.91	ns	ns	ns
Physician Recommended (2) 19.75							22.5	.000	5.16-
Physician Taught breast Self-exam (3)	19.14	.000	8.24-44.45						
Physician Language 19.02	ns	ns	ns	ns	ns	ns	5.11	.015	1.37-
Experience of breast Abnormality 23.1	ns	ns	ns	7.95	.008	1.72-36.74	22.5	.009	2.20-
Knowledge	4.74	.001	1.89-11.92	7.30	.002	2.06-25.96	ns	ns	ns
Seriousness	2.09	.074	.931-4.69	10.75	.000	2.93-39.44	ns	ns	ns
Benefits	ns	ns	ns	3.06	.049	1.01-9.29	ns	ns	ns
Motivation	4.77	.001	1.96-11.62	3.59	.052	.988-13.09	ns	ns	ns

1-Mammography for women 40 and up
2- Has a physician ever advised you to have a mammogram?
3-Has a doctor or health care provider taught you how to perform breast self-examination?
ns=not significant

Mammography Compliance

Bivariate analysis for mammography was conducted for women aged 40 and up. The results indicated that women with health insurance who had a regular health -care provider, with more knowledge, higher health motivation ,perceived less barriers , had been recommended by their physician to have a mammogram, and spoke in English with their provider were more likely to have annual mammograms.

Multivariate Analysis for Breast Cancer Screening Compliance

Table 14 summarizes the results of the multiple logistic regression analysis including the odds ratios and their corresponding confidence intervals for breast cancer screening compliance.

The multivariate analysis indicates participants who had higher than an AA college degree were almost half as likely to practice BSE monthly (OR= .416, P<.004) .Bilingual women (OR=2.74, P<.002) with prior experience of breast abnormality (OR= 4.70 P<.000) and higher health motivation (OR=3.08, P<.000) were more likely to practice BSE monthly. The results of multivariate logistic analysis for CBE compliance for women ages 30-39 illustrated that only four factors were significant predictors. Bilingual women (OR= 12.80, P<.011), with high

Table 13. Bivariate Logistic Regression Model of Association Between Significant Variables and BSE, CBE and Mammography Compliance

	BSE			CBE			Mammography (3)		
Variables	OR	P	CI	OR	P	CI	OR	P	CI
Education	.587	.034	.358-.962	ns	ns	ns (1)	ns	ns	ns
Years in US	ns	ns	ns	ns	ns	ns(1)	ns	ns	ns
Income	ns	ns	ns	ns 1.84	ns .057	ns(1) .981-3.46(2)	ns	ns	ns
Employment	ns	ns	ns	ns 1.81	ns .060	ns (1) .957-3.40(2)	ns	ns	ns
Health Insurance	ns	ns	ns	ns 2.54	ns .030	ns(1) 1.09-5.88(2)	2.73	.056	.976-7.64
Regular Physician	ns	ns	ns	ns 4.76	ns .000	ns(1) 2.04-11.09(2)	3.81	.009	1.39-10.36
Physician Recommended(4)							4.55	.023	1.24-16.73
Physician taught breast self-exam(5)	2.23	.104	.85-5.88						
Physician Lang	ns	ns	ns	ns	ns	ns(1)	3.32	.004	1.45-7.56
Physician Gender	ns	ns	ns	ns 2.21	ns .016	ns(1) 1.16-4.21(2)	ns	ns	ns
Experience of breast abnormality	4.22	.000	2.57-6.93	ns	ns	ns(1)	ns	ns	ns
History of breast cancer	3.15	.015	1.25-7.89	ns	ns	ns(1)	ns	ns	ns
Acculturation	2.38	.003	1.36-4.18	9.05 2.35	.009 .018	1.76-46.70(1) 1.16-4.76(2)	ns	ns	ns
Knowledge	2.42	.001	1.47-3.99	ns ns	ns ns	ns(1) ns(2)	2.26	.077	.914-5.61
Seriousness	ns	ns	ns	ns ns	ns ns	ns (1) ns(2)	ns	ns	ns
Benefits	1.69	.025	1.07-2.70	5.69 2.34	.007 .023	1.59-20.28(1) 1.13-4.87(2)	ns	ns	ns
Barriers	ns	ns	ns	ns .308	ns .003	ns(1) .140-.677(2)	.306	.008	.128-.735
Motivation	1.93	.057	.980-3.81	6.35 3.59	.009 .000	1.59-25.41(1) 1.89-6.83(2)	2.28	.048	1.01-5.162

1-CBE for women 30-39 *BSE only ns=not significant
2-CBE for women 40 and up
3-Mammography for women 40 and up 4- Has a physician ever advised you to have a mammogram?
5-Has a doctor or health care provider taught you how to perform breast self-examination?

perceived benefits (OR= 10.04, P<.006), and health motivation (OR= 7.45, P<.018) were more likely to be compliant with CBE guidelines.

For women 40 years of age and older other factors such as employment and physician's gender were also significant. Those who were employed (OR= 2.12, P<.040), had a male physician (OR= 2.72, P<.006), with high perceived benefits(OR= 2.21, P<.05) and health motivation(OR= 3.46, P=.000) were more likely to have annual CBE . Those who perceived higher barriers (OR=.26, P<.002) and specifically considered time a major barrier were less likely to have annual CBE. Women 40 and older who had a regular health-care provider (OR=3.20, P<.032), were recommended by their physician to have a mammogram (OR= 4.45, P<.038), and spoke in English with their provider (OR= 3.50, P<.005) were more likely to be have annual mammograms.

Table 14. Multiple Logistic Regression Model of Association Between Significant Variables and BSE, CBE and Mammography Compliance

	BSE			CBE			Mammography(3)		
Variables	OR	P	CI	OR	P	CI	OR	P	CI
Education	.416	.004	.231-.751	ns ns	ns ns	ns(1) ns(2)	ns	ns	ns
Employment	ns	ns	ns	ns 2.12	ns .040	ns(1) 1.04-4.32(2)	ns	ns	ns
Regular Physician	ns	ns	ns	ns ns	ns ns	ns(1) ns(2)	3.20	.032	1.11-9.27
Physician Language	ns	ns	ns	ns ns	ns ns	ns(1) ns(2)	3.50	.005	1.46-8.09
Physician Gender	ns	ns	ns	ns 2.72	ns .006	ns(1) 1.33-5.57(2)	ns	ns	ns
Physician Recommended(4)							4.45	.038	1.08-18.3
Physician taught breast self-exam(5)									
Experience of Breast Abnormality	4.70	.000	2.73-8.07	ns ns	ns ns	ns(1) ns(2)	ns ns	ns ns	ns ns
Acculturation	2.74	.002	1.46-5.15	12.80 ns	.011 ns	1.79-91.39(1) ns(2)	ns	ns	ns
Benefits	ns	ns	ns	10.04 2.21	.006 .051	1.93-52.29(1) .99-4.89(2)	ns	ns	ns
Barriers	ns	ns	ns	ns .26	ns .002	ns(1) .106-.617(2)	ns	ns	ns
Motivation	3.08	.000	1.73-5.49	7.45 3.46	.018 .000	1.42-39.23(1) 1.74-6.86(2)	ns	ns	ns

1-CBE for women 30-39
2-CBE for women 40 and up
3-Mammography for women 40 and up
4- Has a physician ever advised you to have a mammogram?
5-Has a doctor or health care provider taught you how to perform breast self-examination?

*BSE only

Discussion

Unfortunately, there is no information about the determinants of breast cancer screening behaviors among immigrant Iranian women living in the United States. This is the first study to examine the predictors of age-specific breast cancer screening participation among immigrant Iranian women ages 30 and up. This study is also unique because of its target population, as it pertains to popular western culture's depiction of Middle Eastern women. In spite of their social , cultural and ethnic differences , Middle Eastern women are frequently This is generally true in the case of Iranian women since their post-revolutionary national image in the minds of the West is a homogeneous picture of veiled submission.

In general, the screening rates for CBE and mammography among the participants in the current study were higher than levels set in the year 2010 Health Objectives and those reported for women nationally. These findings are inconsistent with previous studies on immigrant women living in the United States which indicate low rates of screening compared with the predominantly white populations and even lower rates of screening among first generation immigrants.

In this study nearly all participants had heard of mammography (94.1%), among women ages 40 and up, 7.7% had never had a mammogram. More than eighty percent (81.1%) of the women aged 40 and up reported having a mammogram within the last year, and 9.4% of the women reported having undergone mammography more than two years ago. Routine screening was the reason for obtaining a recent mammogram for 59.5% of the women. Two hundred and fifty four (74.5%) received a mammogram recommendation by their physician. Of the women who reportedly received a physician recommendation 93.3% had at least one mammogram compared with only 6.7% for the women who did not receive a recommendation.

The results revealed that women ages 40 and up were more likely to have ever had a mammogram and were more likely to be have annual mammograms if they were recommended to have a mammogram by their physician, communicated in English with their provider and had a prior experience of breast abnormality. Women who had lived in the United states for more than 10 years, were more likely to have ever had a mammogram . The reason could be that women who have spent more of their lifetime in the US may have higher English proficiency and better understanding of the medical system than more recent immigrants. They may also have had more opportunities for screening. In addition, women who have spent higher portion of their lifetime in

US are more likely to be different from more recent immigrants with respect to important cultural factors and access to health care that may influence their screening practices. Length of stay was not a significant predictor for mammography compliance. The majority (93%) of the women indicated having had at least one CBE. Seventy three percent (73%) of the participants ages 40 and up reported having had a CBE every year. Among women below the age of 40, 65.4% reported having a CBE every year and 10.3% having a CBE every two to three years.

The results indicated that younger women , who had lived in the United States for more than 10 years, had a regular health care provider, with prior experience of breast abnormality, and better knowledge of breast cancer, perceived cancer to be more serious, perceived higher benefits for CBE and with health motivation were more likely to have ever had a CBE.

Those women between the ages 30-39 who were bilingual , with high perceived benefits for CBE, and health motivated were more likely to be compliant with CBE guidelines. For women 40 years of age and older other factors such as employment and physician's gender were also significant predictors of having an annual CBE. Interestingly women who had a male physician were more likely to have annual CBE.

This higher than average reported screening rate for mammography and CBE may reflect the unique circumstances of Iranian immigrant women in this sample. Having health insurance and higher socio-economic status might account for higher screening rates. For example many of the respondents had completed college education (65.7%). Thirty four percent had earned a bachelor degree, 18.8% had master's degrees and 7.3% had doctoral degrees. Sixty four percent of the women were currently employed and worked outside the home . Education and training may have led to employment positions with higher wages. Among those that disclosed their annual family income 18.8% reported earning more than $100,000. More than thirteen percent (13.8%) reported earning between $75,000-$99,999 with the median income being $69,000. As a result the majority of the women reported having health coverage (86.5%) and 85.9% reported having a regular primary health care provider. These factors have repeatedly shown to positively influence women's adherence to screening guidelines and although, there is a consistent and strong association between social class and health status, the extent to which racial/ethnic disparities in cancer screening reflect social class among the racial /ethnic population is rarely addressed (Hoffman-Goetz et al., 1998). Although insurance coverage failed to remain statistically

significant in the multivariate models, having a regular physician, and physician recommendation were factors which were retained in the multivariate model. This may be in part because physician recommendation occurs more frequently among women who receive regular health care and have insurance coverage.

A total of 86.2% of the women had practiced BSE at least once , and 84.8% stated that they had been taught how to perform BSE by a health care provider. Only 38.1% participants practiced BSE monthly and 18.5% reported no practice at all. Results indicated women with an AA college degree or higher, with better knowledge of breast cancer , and higher health motivation, and those who were taught by a physician how to perform breast self-examination and more social support were more likely to have ever performed BSE. Being taught how to practice BSE by a physician was strongly associated (OR= 19.14, P=.000) with a higher likelihood of ever having performed BSE (92.5% versus 7.5%). Those who had higher than an AA college degree were almost half as likely to practice BSE monthly (OR= .416, P<.004) .Bilingual women with prior experience of breast abnormality and higher health motivation were more likely to practice BSE monthly.

The comparatively lower BSE compliance rates are in contrast with the higher annual age specific CBE and mammography rates. However,the low rate of BSE practice is consistent with previous findings with Asian immigrant women(Fung, 1998). This could be due to women placing lower priority on this method of screening considering the fact that women with a history of breast abnormalities were more likely to recognize the importance of regular BSE, and therefore were more likely to practice BSE monthly. In addition , the results showed better knowledge were common significant predictors for ever having had BSE, and CBE but not for BSE or CBE compliance and although 84.8 % reported that they were taught how to perform a BSE by a health care provider, the assessment of BSE knowledge revealed insufficient BSE skills and knowledge in this group. This highlights the importance of physician intervention and that health care providers should use every encounter with the women to address common misconceptions and reinforce the importance of monthly BSE practice.

Previous studies have showed that greater acculturation was associated with higher rates of screening among minority women(O'Malley et al., 1999). In this study acculturation was measured using language preferences and social networks.

The women in this study on average identified themselves as bicultural. in terms of language usage and reported low to moderate levels of acculturation for ethnic or social interaction.

Past studies have found lack of English language proficiency is an important barrier to screening (Taylor et al., 1999). Interestingly, in this study only levels of language acculturation were significant predictors for BSE and CBE compliance. Bilingual women who preferred to speak both Farsi and English equally were more likely to be BSE and CBE compliant. Unlike other studies high levels of linguistic acculturation was not associated with higher screening rates. This could be due to the fact that as indicated in other studies, limited proficiency in English is associated with underlying socioeconomic factors that decrease the use of health care services. Less acculturated women may be newer immigrants and thus less familiar with the health services that are available to them. Preoccupation with the problems of adjusting to a new country could be overwhelming for new immigrant women leading to self-neglect and delay medical visits. These women may face language and cultural barriers to utilize adequate health services. They may also include undocumented immigrants who are reluctant to use any services out of fear of possible deportation.

In summary research has demonstrated that, migration has meant a breakdown of traditional norms for Iranian women (Tohidi, 1993; Ansari, 1992). While Iranian immigrant women are moving away from traditional understandings of gender roles , they are developing their own unique combination of qualities and values representing the cultural dimensions of both their past and present (Tohidi, 1993). Previous findings suggest a large number of the Iranian immigrant women have emigrated and settled under difficult and uncertain circumstances because of the 1978 revolution (Ansari, 1992). Contextual factors such as the Iranian revolution, the hostage crisis and the Iran-Iraq war have negatively affected their exit from home country and reception in the host country. This includes the women that left Iran at a young age and thus lived most of their adult lives in the US. For the most part they attained the material hopes immigrants seek in a new homeland. Their success, however, has not resolved the difficulties they face as individuals and as a group of immigrants living in the United States. These problems include stereotyping, invisibility, harassment and discrimination. In this study more than half have acquired high levels of education , proficiency in the English language, and have secured good jobs.

But similar to other Iranian immigrants have resisted complete socio-cultural assimilation as indicated by low to moderate levels of language acculturation and social- network preferences.

Most of the women were informed about the seriousness of breast cancer and recognized the key role of early detection. However, the assessment of BSE knowledge revealed insufficient BSE skills and knowledge in this group. For example, more than 55.0% of the women surveyed did not know that BSE should be performed monthly . This confirms an interaction between knowledge and practice of BSE.

Another factor for low rates of BSE could be cultural barriers in regards to physical examination of intimate body parts which has been shown to be a barrier to screening for Asian and Latina women. This barrier includes a woman's concern for maintaining her own expectations of modesty and her reluctance to touch her body or to have her body touched by a stranger. In this study 73.7% of the women disagreed that BSE, CBE or mammography is embarrassing and 64.3% of the respondents disagreed with the statement, "performing BSE will be unpleasant", and 82.4% disagreed with the statement, "I don't have enough privacy to perform a BSE". Although there is little information about the cancer screening behaviors of Muslim women, concern for

modesty has also been seen in these communities and should be further explored (Rajaram, 1999).

In the final multivariate model , it appeared that perceived health motivation was the best predictor of BSE compliance. The findings also suggest that in addition to health motivation, perceived benefits and perceived barriers (only in the 30-39 age category) were the only strong predictors of CBE compliance. None of the HBM subscales were able to predict mammography practice or compliance.

This study also highlighted the importance of insurance and regular source of care in breast cancer screening behaviors. Although insurance coverage was not a significant predictor of screening in the final model lack of a regular source of care remained a barrier. Clearly the two measures are related. Since within the US context, access not only includes insurance coverage, but also the type of insurance and having a regular source of care all of which may partially explain different rates in utilization of preventive services. The findings that a woman's prior experience with a breast abnormality rather than her socioeconomic status are important predictors of ever having had a CBE and mammography suggest that interventions should focus on improving communication with the women at the time of their screening, particularly if they have had a previous breast abnormality.

Previous studies indicate that younger women are more likely to receive breast cancer screening. In this study younger women were also more likely to receive CBE. Many studies have shown that immigration is accompanied by decrease in health motivation especially among older immigrants. It may be that without empowerment these women become passive recipients of preventive services and not realize their benefits and regard screenings as a nuisance . In the sample of women 40 years of age and older , in addition to health motivation, barriers and benefits were strong predictors of annual CBE. This matter was underscored by the fact that physician communication and recommendation was a significant predictor of both mammography practice and compliance. Encouraging women in this age group to ask and making them feel confident and comfortable about asking questions at the time of a CBE or mammogram screening may facilitate the likelihood of follow-ups and regular screening.

Low rates of breast cancer screening have also been related to assumed cultural values of fatalism. However, the results of this study indicated that few women believed " if they developed breast cancer they would not live longer than five years", in contrast to the fatalistic view of the disease process. This suggests a positive role of culture in the women's perception of breast cancer which could be applied to culturally appropriate educational programs.

Certain study limitations when interpreting the results of this study needs to be considered. The most important was the use of a convenience sample of immigrant Iranian women in California. Therefore findings may not be generalizable to the broader population of immigrant Iranian women in the US. As there are no published reports on screening practices of Iranian women in United States and national surveys do not specify screening rates for this population, it is not possible to compare these findings with other Iranian women living elsewhere in the United States.

Second, these data came from self-reports and were subject to recall and desirability response bias. Because of the tendency of the subjects to answer questions the way they think is preferred frequency of breast cancer screening practices may have been overestimated.

Despite these limitations the present study is the first attempt to explore the predictors of breast cancer screening behavior among an understudied immigrant population by using a proposed framework that incorporates the well documented traditional determinants of breast cancer screening behavior based on the HBM, while also highlighting socio-cultural determinants of breast cancer screening behaviors .

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ARTICLE 3: THE INFLUENCE OF SOCIAL SUPPORT , PHYSICIAN RECOMMENDATION AND ACCULTURATION ON BREAST CANCER SCREENING BEHAVIORS OF IMMIGRANT IRANIAN WOMEN

Abstract

The purpose of this study is to examine the relationship between physician recommendation, women's reported social support and acculturation on breast cancer screening behaviors of immigrant Iranian women in the United States. Logistic regression was used to identify predictors of women's breast cancer screening. The logistic regression results appear as odds ratios (ORs) and 95% confidence intervals. Backward stepwise multivariate logistic regression using the method of likelihood estimation was conducted to identify the most important predictors after adjusting for other variables (P>.05 for removal from model). Multivariate analysis indicated women who were taught by a physician how to perform breast self-examination were more likely to have ever performed BSE. Women who received support from their friends to perform BSE were 2.13 times more likely to have ever performed BSE. Those who lived in the United States for more than 10 years ,with prior experience of breast abnormality were more likely to have ever had a CBE. Women who received support from their

husbands/partners were 3.5 times more likely to have ever had a CBE. Social support was not a significant predictor of ever having had a mammogram. Women who lived in the United States for more than 10 years and were recommended by their physician to have a mammogram , communicated with their physician in English, and had prior experience with breast abnormalities were more likely to have ever had a mammogram. Bilingual women who were taught by a physician how to perform breast self-examination , with prior experience of breast abnormality were more likely to practice BSE monthly. Family and relatives support was not a significant predictor (OR= 1.62, P<.059) for BSE compliance. Bilingual women between the ages 30-39 were more likely to be compliant with CBE guidelines. For women 40 years of age and older other factors such as employment and having a regular health-care provider were the only significant predictors. Women 40 and older who had a regular health-care provider, were recommended by their physician to have a mammogram , and communicated in English with their provider were more likely to be have annual mammograms. Findings suggest perceived social support is associated with ever performing BSE and having CBE. Socioeconomic status, having a usual source of care, and having a physician's

recommendation for screening all predict screening behaviors of immigrant Iranian women. Bilingual women who preferred to speak both Farsi and English equally were more likely to be BSE and CBE compliant. Thus, English language proficiency may serve to facilitate access to health care as well as increased communication with health care providers.

Introduction

Breast cancer is the most common invasive cancer in women, with more than one million cases and nearly 600,000 deaths occurring worldwide annually. Incidence rates are highest in industrialized nations such as the United States, Australia, and countries in Western Europe. According to the American Cancer Society (ACS) in 2004, approximately 215,990 and in 2005, 211,240 women in the United States will be diagnosed with invasive breast cancer (ACS, 2005). It is estimated that 40,410 women will die from breast cancer in the United States this year (ACS,2005). This translates into approximately 1 in 8.2 women that will receive a diagnosis of breast cancer in her lifetime, and 1 in 30 will die of the disease (ACS, 2003).

It has been well established that there are strong links between social support and positive health outcomes. Many studies have reported the positive influence of social support on women's psychological well being and coping abilities through every stage of breast cancer (Hoskins et al., 1996; Lugton, 1997).

However, very few studies have specifically explored the influence of social support on breast cancer screening. McCance and collegues (1996) examined the importance of influence of other people in getting women to obtain breast cancer screening. Results revealed that the influence of others was highly significant to the practice of breast self-examination and less so for mammography and clinical breast examination. A study by Wagle et al., (1997) investigated the relationship between social support and the frequency and accuracy of BSE practice. Social support was found to be significantly related to the frequency of BSE , but not to the accuracy of BSE. The results also indicated that older women had lower social support scores compared with younger women (Wagle et al., 1997). Another study examined the influence of social support and adherence to recommended breast cancer screening guidelines among a multicultural community (Katapodi and Facione et al., 2002).

The study participants from three racial or ethnic groups (Latina, Caucasian, and African American) who were not breast cancer survivors. The results showed higher levels of social support were related to higher income and higher education. Lower levels of social support were associated with being Latina, completing the survey in Spanish, and being born abroad. Women who did not adhere to screening guidelines (for BSE or CBE) reported less social support (Katapodi and Facione et al., 2002). Patriarchal marital beliefs and gender roles also dictate the support women have for early detection behavior. Studies show that women concealed their participation in breast cancer screening from their male partners or did not seek help for symptoms because their husband did not want a male doctor to perform their breast examination (Salazar, 1996). In regards to Muslim women, Rajaram and Rashidi (1999) point out that men inappropriately use Islam to justify their authority and dominance over their spouses which in term creates another barrier for breast cancer screening. Usually an expectation of obedience to spouse who exerts control over family health decisions is in conflict with the expectation to remain healthy in order to serve the needs of the family.

Numerous studies have documented the role of physicians in influencing their patients' participation in screening (Lerman and Rimer, et al., 1990). Studies in a variety of populations demonstrate that physician recommendation is one of the most important predictors of breast cancer screening behaviors. A study by Slenker and Grant (1989) showed that 89.6% of the women who had been asked by a doctor to get a mammogram had complied with the request, and only 10.4% of the women who had not been asked to have a mammogram had done so.

A study of largely Hispanic women found that physician recommendation and discussion with a doctor or nurse was associated with ever having a mammogram (Zapka et al., 1989). Studies that included minority women have documented a dramatic improvement in the proportion of these women who obtained a mammogram after their doctors recommended this screening procedure (Zapka et al., 1993). Strong patient-provider relationships, with high levels of trust, have also led to better health through adherence to recommended preventive services for low income African-American women (O' Malley and Sheppard, 2004). Physician communication problems may exist due to religious, cultural and linguistic differences between women and their

physicians. Furthermore, research also indicates that physicians are less likely to share information with individuals whom they perceive to be different from themselves in terms of social class, ethnicity, gender, and age (Meleis et al., 1995). In case of Muslim immigrant women , Rashidi and Rajaram (2000), argue that the unique complexities in the socio-cultural backgrounds of these women could also hinder access to healthcare services. Among the socio-cultural barriers are patient-physician communication difficulties and beliefs about cancer and cancer prevention. Health care professionals may also have stereoptypical ideas about Muslim women as being powerless, uneducated and subservient (Meleis et al., 1995). In fact research shows that physicians are less likely to recommend mammograms to minority women (O' Malley et al., 1997). Physical examination of intimate body parts is a barrier to screening for Asian and Latina women. This barrier includes a woman's concern for maintaining her own expectations of modesty and the attitudes of her male sexual partner. Although there is little information about the cancer screening behaviors of Muslim women, concern for modesty has also been seen in these communities (Rajaram and Rashidi 1999). Considering that physician recommendation is one of the most important determinants of mammography, the lack of communication between physician and

the patient is especially detrimental to breast cancer screening rate in this group. Studies also indicate that along with health-professional interventions and SES, acculturation and legal status of immigrant women also determine their level of cancer screening (Harlan et al., 1991). For example in regards to mammography women with no usual source of health care , no health insurance and women who had migrated to the United States within the last 10 years were least likely to have had a mammogram within the last 2 years (Swan, et al., 2003).

In general the literature suggests a direct link between an individual's interaction with social networks and the use of breast cancer screening. Numerous studies have shown that early detection saves lives and increases treatment options, therefore, understanding the underlying factors that influence women's decision to adhere to breast cancer screening guidelines is essential. Furthermore, there are considerable differences between and within minority groups. Preventive health behavior is not homogenous and while the migration experience itself is mediated by gender and age, it is influenced by the changes in socio-economic status, the changes in social networks, and the changes in culture. (Rogler, 1994). Different ethnic groups have their own unique socio-historical experiences in the United States. Iranians are perhaps the least understood and

well-known of any ethnic group in the United States. This problem has been compounded by the declining relations between the US and Iran which has led to the maintenance of negative attitudes and stereotypes towards the Iranian immigrants in US. In addition, experiences and screening behaviors of Iranian immigrant women might be quite distinct and different from ethnic groups and cultures that have been previously studied. This underscores the potential importance of using and building women's social networks to reinforce breast cancer screening. This is the first study to directly examine the influence of social support , physician recommendation and acculturation on adherence to breast cancer screening guidelines among immigrant Iranian women.

Methods

Sample and Setting

The study design was a cross-sectional survey. The participants in this study consisted of self-identified first generation immigrant Iranian women who were born and/or lived in Iran before they migrated to the United States (N=341).

The inclusion criteria for study participants included: a) Iranian born women between the ages of 30-80 years who lived in California, b) Iranian women able to read and speak English and /or Farsi.

Instrument

Social support on breast cancer screening was assessed using three subscales measuring the perceived support from 1) husband/partner; 2) family/relatives; and 3) friends as it relates to compliance with breast cancer screening guidelines.

Acculturation was measured with a tool developed by Marin and colleagues (1987). This scale measures acculturation on the basis of length of time in the United States, language use, linguistic proficiency and social networks. The overall scale has a reliability of 0.92. and a validity of 0.65. This scale measures : 1) language use items 1-4 : 2) social network items 4-7. Acculturation level is measured utilizing a five point Likert-type scale. Scores range from one to five, with five indicating the highest degree of acculturation. An average score of 2.99 or less on the total score indicates low acculturation.

Health professional recommendation was assessed by asking :1) if a health professional (for example doctor, nurse) has taught them how to perform breast self-examination : 2) if a doctor has recommended that they have a mammogram.

History of Breast problems was assessed by asking whether the woman has ever experienced :1) unusual pain, swelling or a lump: 2) an abnormal mammogram that resulted in further testing :3) both, or : 4) none. Family history of breast cancer was assessed by asking the woman if anyone close to her had ever been diagnosed as having breast cancer (yes/no). Personal history of breast cancer was assessed by asking the woman if she had ever been diagnosed with breast cancer (yes/no).

The demographic questionnaire gathered information about age, education level, income, marital status, length of stay in the United States, regular physician, provider's gender and language and health insurance coverage.

Previously developed mammography, CBE, BSE behavior indices developed by the ACS guidelines was adapted to measure compliance/frequency of early detection behaviors. A participant was rated as compliant if her breast cancer screening behavior was consistent with guidelines set by the ACS. The subject was rated

non-compliant if she did not follow the recommended screening guidelines specified by ACS and in accordance with her age. Breast cancer screening was measured by obtaining information on frequency/compliance with BSE, CBE, and mammography screening.

Women were asked whether they ever had that procedure and were coded accordingly (yes/no/ Not Applicable). The women were also asked if they had been recently screened. Regarding mammography in addition to compliance/frequency items were developed to assess purpose and total number of mammograms.

Face and content validity of the instrument was evaluated by seven experts in the fields of public health, nursing, and medical anthropology. The panel of experts was asked to rate the items for wording, relevancy, importance and cultural sensitivity. Length and the clarity of the questionnaire was also considered.

Internal consistency reliability assessment using Cronbach's alpha was conducted for the pre-test survey. Item analysis of each subscale was performed. The social support scale had three sub-scales to assess support from husband/partner, families and friends for BSE, CBE and mammogram. The internal consistency reliabilities for each sub-scale ranged from .82 to .96 and the Cronbach's alpha for the combination of the three sub-scales was .90.

The acculturation scale consisted of 7 items with two sub-scales to measure constructs of language use preferences (3 items) and social network preferences (4 items). The internal consistency reliabilities was .74 and .80 for each subscale. The Cronbach's alpha for the combination of two sub-scales was .84.

Procedure

Telephone contact and personal visits were made with several community centers, cultural centers, Farsi schools, women's groups, community affiliated- service organizations, and local mosques in California and the goal and importance of the research was described through community newsletters, email list serves, public announcements and social networking. An invitation to participate in the study was also posted on a popular Persian news website and was updated periodically. To recruit participants the investigator attended monthly meetings , seminars and informal gatherings to explain the purpose and significance of the research. Several special events such as the Iranian Women's day, Mother's day and religious celebrations were held during the data collection period. The investigator attended all these special events and recruited subjects. By surveying a variety of groups and multiple settings the diversity of the women participants in terms of age, education, and income was expanded. Upon recruitment each participant received a questionnaire package in the language of

their choice (English or Farsi) containing a cover letter with information pertaining to the study, an informed consent document, and the questionnaire and an informational booklet on breast cancer screening. All participants received an informational booklet titled, "Breast Health; What every women should know", donated by the Susan G. Komen Breast Cancer Foundation. This booklet was designed to provide general information about common breast changes, breast cancer risks and options for breast cancer screening and treatment. Participants completed the questionnaire in approximately 15-17 minutes. In most cases the questionnaires were completed in the presence of the investigator, but occasionally they were returned by mail. To increase on site response rates participants who completed and returned the survey immediately received a keep T-shirt donated by the American Cancer Society and the Susan G. Komen Breast Cancer Foundation for their voluntary participation.

Statistical Analysis

Statistical analysis was performed using SPSS version 11.0.data analysis included the use of descriptive statistics, testing differences between means and logistic regression. Descriptive statistics were used to understand women's breast cancer screening behaviors, demographic

characteristics, socioeconomic status, level of acculturation, and social support for breast cancer screening. Testing differences between means was used to assess similarities and differences between women living in Northern and Southern California.

Logistic regression was used to predict a binary dependent variable from a set of independent variables. The logistic regression results appear as odds ratios (ORs) and 95% confidence intervals. Backward stepwise multivariate logistic regression using the method of likelihood (-2LL) estimation was conducted to identify the most important predictors.

Results and Discussion

Five hundred and twenty (520) surveys were distributed to potential participants over a three month period from August 25th to November 30th, 2003. A total of 361 surveys were returned, yielding in a 69.4 % completion rate. Eleven surveys were excluded from the analysis because 8 women did not meet the age criterion and 3 women were not residents of California . Nine cases were deleted with missing data exceeding 10%. Therefore, 341 surveys were included in the analysis.

The mean age of study participants was 44 years (SD= 2.01) with a range in age of 30 to 75 years. With 27.6% of the women in the 40-45 age category . About 31.1% of the women were under 40 and 24.1% were 50 years of age or older. All participants were immigrants, with a mean length of residence in the United States of 16 years. Ranging from a year to more than 50 years. Over 68 percent (68.3%)of the respondents were married. Twelve percent of the women were never married and 19.4% were widowed, separated or divorced. Many of the respondents had completed college education (65.7%). Thirty four percent had bachelor degrees, 18.8% held masters, and 7.3% were educated at the doctoral level. Sixty four percent of the women were currently employed and 13.8% were full time home- makers. Among those that disclosed their annual family income 18.8% reported earning more than $100,000. More than thirteen percent (13.8%) reported earning between $75,000-$99,999. The Median income was $69,000, but 8.8% also reported earning less than $10,000.

The majority of the women were insured (86.5%) and 85.9% reported that they had a regular primary health care provider. Among the participants 11.7% had a prior experience with unusual breast symptoms, and 6.2% had received an abnormal mammogram. Twenty two percent reported experiencing both. More than half of the women

(60.1%) had no prior experience with any unusual symptoms and/or an abnormal mammogram. Approximately 7.3% of the women had been diagnosed with breast cancer. Among the respondents 37.5% reported knowing a relative or a close friend who had been diagnosed with breast cancer.

Acculturation

Acculturation variables included language use, and social network preference. Length of residence in the US was used in this study as an additional indicator of acculturation. The means and standard deviations of the language use variables and social preference are shown in Table 15. The higher scores indicated a higher level of acculturation. Seventy six percent of the respondents used only the Farsi language as a child. Approximately 35.2% preferred to read and speak in Farsi and 40.5% used both Farsi and English equally for reading and speaking. Among the respondents 51.6 % were more likely to speak Farsi at home and 23.2% spoke both languages equally. Only 3.5% spoke only English at home. With regards to language of communication with friends 41.6% spoke to their friends primarily in Farsi and 31.1% spoke both Farsi and English equally.

The other measure of acculturation was social network preference. Twenty nine percent of the women indicated that their close friends were all Iranian ethnics and 40.2% had more Iranian ethnic friends than Americans. In response to preference for social gatherings and parties, 27.6% indicated preferring going to all Iranian ethnic gatherings and 30.5% preferred more Iranian ethnic gatherings/parties than American. More than thirty eight percent of the women preferred both types of gatherings/parties equally and only .9% preferred only American gatherings/parties. All participants were immigrants, with a mean length of residence in the United States of 16 years. Ranging from a year to more than 50 years.

Table 15. Immigrant Iranian women's scores on the acculturation scale

Acculturation Subscale	**Possible Score Range**	**Mean ± SD**
Language use items		
Language used in reading	1-5	2.58 ±0.953
Language used as a child	1-5	1.43 ± 0.88
Language spoken at home	1-5	1.91 ± 1.11
Language used with friends	1-5	2.22 ± 1.25
Social network preference items		
Ethnicity of close friends	1-5	2.21 ± 1.93
Ethnicity of persons that visit	1-5	2.12 ± 0.92
Socialization preference	1-5	2.18 ± 0.89

Note: The possible range of subjects' mean score is 1.00, indicative of low acculturation to a high of 5.00, indicative of high acculturation.

Social Support

Results of the social support scale are shown in Table 16. Women had strong to moderate support from their husbands/partners, family members and friends to practice breast cancer screening behaviors. More than 50% of the women reported strong support from family members to engage in mammography. BSE was the least discussed among all three social support scales followed by CBE. More than nineteen percent reported never discussing BSE with their husband /partner, and more than 24 % never discussed BSE with either friends or family members. Twelve percent of the women never discussed CBE with husbands/partners, 18.8% never discussed CBE with family members and 20.8% never discussed CBE with friends.

Breast Cancer Screening Profile

A total of 86.2% of the women had practiced BSE at least once , Only 38.1% participants practiced BSE once a month and 18.5% reported not practice at all. The comparatively lower BSE rates are in contrast with the higher annual CBE and mammography rates.

Table 16. Immigrant Iranian women's perceived social support for breast cancer screening (N=341)

Source of Support	Level of Support (%)				
	High	**Moderate**	**Low**	**Never Discuss**	**Not Applicable**
Husband /Partner					
BSE	35.2	15.0	5.0	19.6	25.2
CBE	38.4	19.1	5.3	12.6	24.6
Mammogram	39.6	19.1	5.9	10.9	24.6
Family					
BSE	44.0	18.5	6.5	25.8	5.3
CBE	47.8	23.5	5.0	18.8	5.0
Mammogram	50.4	22.0	5.9	17.0	4.7
Friends					
BSE	38.4	24.9	7.6	24.6	4.4
CBE	41.3	26.1	8.2	20.8	3.5
Mammogram	44.6	26.4	7.9	17.6	3.5

The majority (93%) of the women indicated having had at least one CBE. Seventy three percent (73%) of the participants ages 40 and up reported having had a CBE every year. Among women below the age of 40, 65.4% reported having a CBE every year and 10.3% having a CBE every two to three years. In this study nearly all participants had heard of mammography (94.1%), among women ages 40 and up, 7.7% of the had never had a mammogram. For women ages 40 and up 55.5% had a mammogram less than a year ago and 25.6% of the women had

a mammogram one year ago. Therefore, 81.1% of the women aged 40 and up reported having a mammogram within the last year, and 9.4% of the women reported having undergone mammography more than two years ago. Routine screening was the reason for obtaining a recent mammogram for 59.5% of the women.

Multivariate Analysis for Breast Cancer Screening Practice

Table 17 summarizes the results of the multiple logistic regression analysis including the odds ratios and their corresponding confidence intervals for breast cancer screening practice. The multivariate analysis indicated women with an AA college degree or higher and those who were taught by a physician how to perform breast self-examination (OR=19.97, P=.000) were more likely to have ever had a BSE. Women who received support from their friends to perform BSE were 2.13 times more likely to have ever had a BSE.

Those who lived in the United States for more than 10 years (OR=6.76, P=.000) with prior experience of breast abnormality (OR=7.1, P<.003) were more likely to have ever had a CBE. Having a regular source of health care was not a very significant factor in the final model (OR=2.45, P<.084). Women who received support from their husbands/partners were 3.5 times more likely to have ever had a CBE. Women who lived in the

United States for more than 10 years (OR= 6.97 P<.007), were recommended by their physician to have a mammogram (OR= 22.6, P=.000), communicated with their physician in English (OR=5.11, P<.015)

Table 17. Multiple Logistic Regression Model of Association Between Socio-cultural Variables and BSE, CBE and Mammography Practice

	BSE			**CBE**			**Mammography (1)**		
Variables	OR	P	CI	OR	P	CI	OR	P	CI
Education	2.03	.065	.958-4.32	ns	ns	ns	ns	ns	ns
Years in US	ns	ns	ns	6.76	.000	2.63-17.42	6.97	.007	1.69-28.6
Regular Physician	ns	ns	ns	2.45	.084	.888-6.78	ns	ns	ns
Physician Recommended (2)							22.6	.000	5.16-19.75
Physician Taught breast Self-exam (3)	19.97	.000	9.39-42.47						
Physician Language	ns	ns	ns	ns	ns	ns	5.11	.015	1.37-19.02
Experience of breast Abnormality	ns	ns	ns	7.1	.003	1.92-26.12	22.6	.009	2.19-23.1
Social Support									
Husband/Partner				3.52	.012	1.32-9.39			
Family/Relatives									
Friends	2.13	.047	1.01-4.49						

1-Mammography for women 40 and up

2- Has a physician ever advised you to have a mammogram?

3-Has a doctor or health care provider taught you how to perform breast self-examination?

ns=not significant

and had prior experience with breast abnormalities (OR= 22.6, P<.009) were more likely to have ever had a mammogram. Social support was not a significant predictor of ever having had a mammogram.

Multivariate Analysis for Breast Cancer Screening Compliance

Table 18 summarizes the results of the multiple logistic regression analysis including the odds ratios and their corresponding confidence intervals for breast cancer screening compliance. The multivariate analysis indicates bilingual women (OR=2.34, P<.004) who were taught by a physician how to perform breast self-examination (OR=5.49, P=.000) , with prior experience of breast abnormality (OR= 4.12, P=.000) were more likely to practice BSE monthly. Family and relatives support was a slightly significant predictor (OR= 1.62, P<.059) for BSE compliance.

The results of multivariate logistic analysis for CBE compliance for women ages 30-39 indicated that only one factor was a significant predictor. Bilingual women (OR= 5.28, P<.003)were more likely to be compliant with CBE guidelines. For women 40 years of age and older other factors such as employment (OR= 2.04, P<.028) and having a regular health-care provider (OR=4.03, P<.002) were the only significant predictors.

Table 18. Multiple Logistic Regression Model of Association Between Socio-cultural Variables and BSE, CBE and Mammography Compliance

Variables	BSE			CBE			Mammography(3)		
	OR	P	CI	OR	P	CI	OR	P	CI
Employment	ns	ns	ns	ns 2.04	ns .028	ns(1) 1.08-3.87(2)	ns	ns	ns
Regular Physician	ns	ns	ns	ns 4.03	ns .002	ns(1) 1.68-9.65(2)	3.90	.004	1.54-9.57
Physician Language	ns	ns	ns	ns	ns	ns(1) ns ns	3.69 ns(2)	.001	1.74-7.86
Physician Gender	ns	ns	ns	ns ns	ns ns	ns(1) ns(2)	ns	ns	ns
Physician Recommended(4)							9.39	.000	3.13-28.2
Physician taught breast self-exam(5)	5.49	.000	1.32-4.15						
Experience of Breast Abnormality	4.12	.000	2.49-6.79	ns ns	ns ns	ns(1) ns(2)	ns ns	ns ns	ns ns
Language Acculturation	2.34	.004	.170-1.44	5.28 ns	.003 ns	1.76-15.83(1) ns(2)	ns	ns	ns
Social Support				ns	ns	ns	ns	ns	ns
Husband/Partner Family/Relatives Friends	1.62	.059	.962-2.74						

1-CBE for women 30-39
2-CBE for women 40 and up
3-Mammography for women 40 and up

4- Has a physician ever advised you to have a mammogram?

5-Has a doctor or health care provider taught you how to perform breast self-examination?

*BSE only ns=not significant

Women 40 and older who had a regular health-care provider (OR=3.90, P<.004), were recommended by their physician to have a mammogram (OR= 9.39, P=.000), and spoke in English with their provider (OR= 3.69, P<.003) were more likely to be have annual mammograms .

Discussion

This is the first study to examine the influence of social support and physician recommendation and acculturation on breast cancer screening behaviors of immigrant Iranian women in the United States.

In non- Western cultures such as Iran, the family ,group or community often assumes major responsibility for its members' well-being (Tahmaseb et al., 2001). A study of immigrant Iranian women's adaptation to life in the United states points out that a key factor influencing the quality of life and well –being of all the women in the study was their relationship with their families. Relationships with spouses , children , grandchildren , and friends were a major source of life satisfaction. The study concludes that the nature of one's social and emotional support greatly influences adjustment to the new cultural environment(Tahmaseb et al., 2001) . In this study women had strong to moderate support from their husbands/partners, family members and friends to practice breast

cancer screening behaviors. More than 50% of the women reported strong support from family members to engage in mammography. A study by Wagle et al., (1997) investigated the relationship between social support and the frequency and BSE practice. Social support was found to be significantly related to the frequency of BSE. The results of this study also showed social support from friends was a significant predictor of ever performing BSE and husband/partner support was a significant predictor of ever having had a CBE. BSE was the least discussed among all three social support scales followed by CBE . Among the participants only 38.1% practiced BSE once a month and 18.5% reported not practice at all. More than nineteen percent reported never discussing BSE with their husband /partner, and more than 24 % never discussed BSE with either friends or family members. One explanation for low rates of BSE discussion could be cultural barriers in regards to conversations about intimate body parts which has been shown to be a barrier to screening for Asian and Latina and Muslim women. Several surveys of breast cancer screening suggest that religious beliefs and customs of Muslim women have significant impact on whether they choose to participate in such screening exams (Rashidi and Rajaram, 2000; Underwood and Shaikha, 1999). This barrier includes a woman's concern for maintaining her own and her family's

expectations of modesty and also her reluctance to touch her body or to have her body touched by a stranger. The impact of religious and cultural values on health care behaviors of Muslim women from different immigrant backgrounds has shown that many of these women resist screening practices that are standard in the US but which threaten their cultural and religious values (Matin and LeBaron, 2004).

Numerous studies have documented the role of physicians in influencing their patients' participation in screening (Lerman and Rimer, et al., 1990) and many studies have linked women's SES to lower screening behavior , but few studies have examined the link between physician recommendation and SES. Low SES and economic barriers likely effect breast cancer screening behavior in several ways. For example, physicians perceptions about the cost of mammography, women's inability to pay combined with Physician communication problems due to religious, cultural, gender , and linguistic differences between women and their female/male physicians may reduce the likelihood of recommendation (Burack and Linag, 1989; Dolan et al., 1995). A study by O'Malley and colleagues (2001) investigated the association between physician recommendation and women's race/ethnicity, socioeconomic status (SES), found physician recommendation was higher among women

who had access to or involvement with the medical care system and was lower among women who were vulnerable--older, lower income, and lower educational attainment. Although access to and involvement with the medical care system was strongly and positively associated with report of a physician recommendation, vulnerability, as indicated by SES and age, had a greater effect on the rate of physician recommendation in this population. In this study minority of women reported indicators of limited access (no health insurance and or no regular physician) and physician recommendation was a significant predictor of both ever having had a mammography and compliance.

Previous studies have showed that greater acculturation was associated with higher rates of screening among minority women (O'Malley, 1999). Other researchers have pointed out that level of acculturation is associated with late stage diagnosis of breast cancer and lack of screening practices among minority women. Most acculturation models would predict high scores of acculturation based on the criteria that most of the women in this study left Iran at a young age and thus have lived most of their adult lives in the US. More than half have acquired high levels of education , proficiency in the English language, and have secured good jobs. However, women in this study did not report high levels of acculturation and similar to other Iranian

immigrants have resisted complete socio-cultural assimilation . According to Marks et al., (1987) and Solis et al., (1990) acculturation is not the most important element of health behavior. They both suggest that access to services and demographics are all stronger determinants of breast cancer screening. These findings are more consistent with the results of this study.

In this study acculturation was measured using language preferences and social/ethnic networks. The women in this study on average identified themselves as bilingual and reported low to moderate levels of acculturation for social/ethnic network preference. Past studies have found lack of English language proficiency is an important barrier to screening (Taylor, 1984). Marin and Marin (1991) point out that language preference is strongly associated with SES and tends to be highly correlated with educational level. Therefore, a more useful conception of language preference might be to define it as a behavioral aspect of "functional acculturation"(Neff and Hoppe, 1993). Meaning that English proficiency may act as a facilitator for functional participation in the dominant culture. Interestingly, in this study high levels of language acculturation was not a significant predictors for breast cancer screening compliance. In fact bilingual women who preferred to speak both Farsi and English equally were more likely to be BSE and CBE compliant. Thus, English language proficiency may serve

to facilitate access to health care as well as increased communication with health care providers.

Of particular concern when studying minority populations, is failure to consider the specific nature of the host or "mainstream" society. In its health research application, the existence of a particular "mainstream" culture to which people are adapting is implicitly speculated. This presumption seems misguided, given the complex nature of Western society. A more appropriate representation might be one that assumes an intricate pattern, wherein a variety of cultures contribute to the overall fabric of the larger society (Berry, 1993). In order to better understand life transitions of these women, Anderson (2000) argues, that the direction of future research "should make space to understand cultural meanings not as neutral scripts for people's lives tied to their ethnic roots, but as dynamic , socially constructed , and produced within historical , gendered, raced, and political contexts."

In general screening rates for CBE and mammography among the participants in the current study were higher than levels set in the year 2010 Health Objectives and those reported for women nationally. These findings are inconsistent with previous studies on immigrant women living in the United States which indicate low rates of screening

compared with the predominantly white populations and even lower rates of screening among first generation immigrants.

Certain study limitations when interpreting the results of this study needs to be considered. The most important was the use of a convenience sample of immigrant Iranian women in California. Therefore findings may not be generalizable to the broader population of immigrant Iranian women in the US. As there are no published reports on screening practices of Iranian women in United States and national surveys do not specify screening rates for this population, it is not possible to compare our findings with other Iranian women living elsewhere in the United States.

Second, theses data came from self-reports and were subject to recall and desirability response bias. Because of the tendency of the subjects to answer questions the way they think is preferred frequency of breast cancer screening practices may have been overestimated.

Despite these limitations, this study is the first attempt to examine the influence of social support and physician recommendation and acculturation on breast cancer screening behaviors of immigrant Iranian women in the United States.

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CHAPTER 5

CONCLUSION

Breast cancer is the most frequent cancer diagnosis received by women in the US and is the second leading cause of cancer deaths among women (ACS,2005). Research regarding breast cancer screening behaviors of Middle Eastern women remains very limited and studies about breast cancer screening behaviors of Iranian immigrant women are non-existent.

The purpose of this study was to describe Iranian immigrant women's knowledge, beliefs and attitudes towards breast cancer, and their breast cancer screening behaviors. Furthermore, this study explored key factors that may predict breast cancer screening among immigrant Iranian women . This study was the first attempt to address this research gap and provide a preliminary understanding of the health practices in this understudied ethnic group. This information will in turn provide suggestions for more focused ethnic specific health promotion programs to increase breast cancer screening behavior among this population.

In general screening rates for CBE and mammography among the participants in the current study were higher than levels set in the year 2010 Health Objectives and those reported for women nationally. These findings are inconsistent with previous studies on immigrant

women living in the United States which indicate low rates of screening compared with the predominantly white populations and even lower rates of screening among first generation immigrants. The comparatively lower BSE compliance rates are in contrast with the higher annual age specific CBE and mammography rates. However,the low rate of BSE practice is consistent with previous findings with other immigrant women(Fung, 1998).

The findings from this study indicated women with a college degree or higher, with better knowledge of breast cancer , and higher health motivation, and those who were taught by a physician how to perform breast self-examination and with more social support were more likely to have ever performed BSE. Bilingual women with prior experience of breast abnormality and higher health motivation were more likely to practice BSE monthly.

Younger women , who had lived in the United States for more than 10 years, had a regular health care provider, with prior experience of breast abnormality, and better knowledge of breast cancer, perceived cancer to be more serious, perceived higher benefits for CBE and with health motivation were more likely to have ever had a CBE. Those women between the ages 30-39 who were bilingual, with high perceived benefits for CBE, and health motivated were more likely to be compliant

with CBE guidelines. For women 40 years of age and older other factors such as employment and physician's gender were also significant predictors of having an annual CBE. Interestingly women who had a male physician were more likely to have annual CBE.

Women ages 40 and up were more likely to have ever had a mammogram and were more likely to be have annual mammograms if they were recommended to have a mammogram by their physician, communicated in English with their provider and had a prior experience of breast abnormality. Women who had lived in the United States for more than 10 years, were more likely to have ever had a mammogram .

Certain study limitations when interpreting the results of this study needs to be considered. The most important was the use of a convenience sample of immigrant Iranian women in California. Therefore findings may not be generalizable to the broader population of immigrant Iranian women in the US.

As there are no published reports on screening practices of Iranian women in United States and national surveys do not specify screening rates for this population, it is not possible to compare these findings with other Iranian women living elsewhere in the United States.

Second, these data came from self-reports and were subject to recall and desirability response bias. Because of the tendency of the subjects to answer questions the way they think is preferred frequency of breast cancer screening practices may have been overestimated.

Despite these limitations , this study is the first of its kind to bring into focus Iranian immigrant women's breast health issues, an understudied population in terms of health promotion and disease prevention efforts. This information will in turn provide suggestions for more focused ethnic specific health promotion programs to increase breast cancer screening behavior among this population. This study helps demonstrate that the socio-cultural integration of Iranian immigrant women is affected by the cultural divide between their native home and the host society and the consequent deconstruction and reconstruction of gender roles. In addition, it pertains to popular western culture's depiction of Middle Eastern women. In spite of their social , cultural and ethnic differences , Middle Eastern women are frequently portrayed homogeneously which reinforce stereotypes, marginalization, and racial and gender biases.

This is generally true in the case of Iranian women since their post-revolutionary national image in the minds of the West is a homogeneous picture of veiled submission. In addition, recent reports highlight the Iranian immigrant community's sensitive and difficult position due to the troubled nature of the US Iranian relationship in the past two and a half decades and the continuing tensions in the U.S. relations with Iran in particular, and the Middle East in general. The Iranian community in the U.S. has been under stress ever since the 1979 Islamic revolution and hostage crisis in Iran in addition to the alarming number of reports of discrimination and racial profiling post-9/11 .

Furthermore, the common culture shared by the investigator and the study participants. Shared culture and language and use of a Persian (Farsi) version of the questionnaire facilitated the quality of data collection and allowed collection of data from a diverse population which resulted in a high response rate.

The use of pilot study was useful in refining and improving the questionnaire. The pilot study provided insight on the unexpected and evaluated the feasibility of the procedure.

This study was an initial attempt to shed light on a population that has not been studied before, given that there are no published studies on breast cancer screening behaviors of immigrant Iranian women in United States. Our research obtained descriptive information about breast cancer screening practices of Iranian immigrant women in United States, and provided preliminarily baseline data for future studies. The current study also explored factors that best predict and explain Iranian immigrant women's breast cancer screening practices. For example, this study demonstrates a significant association between relevant breast cancer knowledge and screening compliance of immigrant Iranian women. This finding is also consistent with other studies of immigrant women regarding cancer screening which underscores the need to address the knowledge gap and educate immigrant women about breast cancer and recommended screening methods. This study provides valuable information to health care providers as well as researchers and public health educators. The results of this study can make a significant difference in designing guidelines for culturally sensitive interventions and educational material to improve breast cancer screening

This research should be expanded to include Qualitative data on socio-cultural factors in order to provide more information on this group. In addition future research should be aim at design, delivery and evaluation of interventions.

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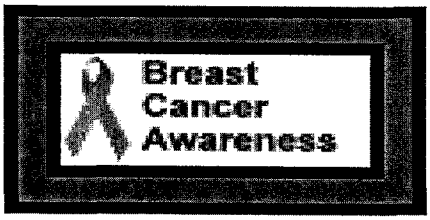
APPENDIX A

Breast Health Questionnaire

Breast Cancer Screening Behaviors Among Immigrant Iranian Women



Breast Health Questionnaire

We are interested in learning about breast cancer screening behaviors of immigrant Iranian women. It will take you approximately 17 minutes to complete this survey. All of your answers and comments will be kept strictly confidential. **Thank You!**

The following questions will provide us with information about your breast cancer screening behaviors. Please circle the most appropriate answer or fill in the blanks. Thank You!

1. **Do you know how to do breast self-examination (BSE)?**

   1. YES 2. NO

2. **Have you ever practiced breast self-examination (BSE)?**

   1. YES 2. NO

3. **Has a doctor or health care provider taught you how to perform a breast self-examination (BSE)?**

   1. YES 2. NO

4. **Would you say you practice breast self-examination (BSE):**

   1. ONCE A MONTH
   2. ONCE EVERY TWO MONTHS
   3. ONCE EVERY THREE MONTHS
   4. OTHER _____
   5. NOT AT ALL

5. **Have you ever had a clinical breast examination (CBE)?** *(A doctor or nurse examines the breasts for unusual lumps through touch)*

   1. YES 2. NO

6. **How often do you have a clinical breast examination (CBE)?** *(A doctor or nurse examines the breasts for unusual lumps through touch)*

   1.EVERY YEAR
   2.EVERY 2 YEARS
   3.OTHER_____

7. **Have you heard of a mammogram?** *(A mammogram is an x-ray of the breasts taken by a machine that presses against the breast while the picture is taken)*

   IF YOU HAVE NOT HEARD OF A MAMMOGRAM SKIP TO Q- 13

   1. YES 2. NO

8. Has a physician ever advised you to have a mammogram?

1. YES 2. NO

9. Have you ever had a mammogram?

1. YES 2. NO

10. (If you <u>have had</u> a mammogram) When was your most recent mammogram?

1. LESS THAN ONE YEAR AGO
2. ONE YEAR AGO
3. MORE THAN TWO YEARS AGO
4. OTHER_____

11. What was the reason for your most recent mammogram? *(Please circle one number)*

1. ROUTINE CHECKUP
2. FOLLOW UP TO A PROBLEM
3. OTHER_____

12. What is the total number of mammograms you have had in your life?

TOTAL_____

The following questions will ask about your knowledge of breast cancer. *(Please circle one number for each question)*

13. Most breast lumps are found by : *(Please circle one number)*

1. WOMEN THEMSELVES
2. PHYSICIAN
3. MAMMOGRAM
4. DON'T KNOW

14. At what age should a woman begin doing breast self-examination? *(Please circle one number)*

1. 20
2. 30
3. 35
4. ABOVE 35
5. DON'T KNOW

15. How often should a breast self- examination be performed? *(Please circle one number)*

1. EVERY 6 MONTHS
2. ONCE A MONTH
3. ONCE A WEEK
4. DON'T KNOW

16. When feeling the breast, you should: *(Please circle one number)*

1. USE THE PADS OF YOUR FINGERS
2. USE THE TIPS OF YOUR FINGERS
3. DON'T KNOW

17. Abnormal breast change includes the following: *(Please circle one number)*

1. DISCHARGE
2. LUMP, HARD KNOT, OR THICKENING
3. DIMPLING OF THE SKIN
4. ALL OF THE ABOVE
5. DON'T KNOW

18. A woman who regularly examines her breasts is doing one of the most effective methods of breast cancer detection: *(Please circle one number)*

1. TRUE 2. FALSE 3. DON'T KNOW

19. Mammography can detect lumps that can't be felt. *(Please circle one number)*

1. TRUE 2. FALSE 3. DON'T KNOW

20. If a woman gets regular mammography, she does not need to do breast self- examination (BSE) or have clinical breast examinations (CBE). *(Please circle one number)*

1. TRUE 2. FALSE 3. DON'T KNOW

21. Mammography is recommended for women 40 years and older. *(Please circle one number)*

1. TRUE 2. FALSE 3. DON'T KNOW

22. Breast self-examination should be performed during your period when lumps are most easily detected: *(Please circle one number)*

1. TRUE 2. FALSE 3. DON'T KNOW

23. An important part of breast self-examination is looking at your breasts in the mirror. *(Please circle one number)*

1. TRUE 2. FALSE 3. DON'T KNOW

24. Some nipple discharge is expected, as you get older when you squeeze the nipple during breast self-examination. *(Please circle one number)*

1. TRUE 2. FALSE 3. DON'T KNOW

25. Breast self-examination should include feeling for lumps under your arms. *(Please circle one number)*

1. TRUE 2. FALSE 3. DON'T KNOW

Another important part of understanding women's reactions to breast cancer is how they think about this health problem. We want to know <u>how much you agree or disagree</u> with the following statements. *(Please circle one number for each question)*

	STRONGLY DISAGREE	*DISAGREE*	*NEUTRAL*	*AGREE*	*STRONGLY AGREE*
26. The thought of breast cancer scares me.	1	2	3	4	5
27.I am afraid to think about cancer.	1	2	3	4	5
28.Problems I would experience with breast cancer would last a long time.	1	2	3	4	5
29. Breast cancer would threaten a relationship with my partner.	1	2	3	4	5
30.If I had breast cancer my whole life would change.	1	2	3	4	5
31. If I developed breast cancer, I would not live longer than 5 years.	1	2	3	4	5

These questions are about <u>what you believe are the benefits and barriers</u> of performing <u>breast self-examination</u> (BSE). *(Please circle one number for each question)*

	STRONGLY DISAGREE	*DISAGREE*	*NEUTRAL*	*AGREE*	*STRONGLY AGREE*
32. When I do **breast self-examination** I feel good about myself.	1	2	3	4	5
33. When I complete monthly **breast self- examination** I don't worry as much about breast cancer.	1	2	3	4	5
34. Completing **breast self-**	1	2	3	4	5

examination each month will allow me to find lumps early.					
35. If I complete **breast self-examination** monthly I will decrease my chances of requiring radical or disfiguring surgery if breast cancer occurs.	1	2	3	4	5
36. If I complete monthly **breast self-examination** it will help me find a lump which might be cancer before it is detected by a doctor or nurse.	1	2	3	4	5
37. Doing **breast self-examination** during the next year will make me worry about breast cancer.	1	2	3	4	5
38. **Breast self-examination** will be embarrassing to me.	1	2	3	4	5
39. Doing **breast self-examination** will be unpleasant.	1	2	3	4	5
40. I don't have enough privacy to do **breast self-examination.**	1	2	3	4	5
41. I am confident I can perform **breast self-examination** correctly.	1	2	3	4	5

We are interested in how much you agree or disagree with the following statements concerning clinical breast examination (CBE). *(Please circle one number for each question)*

	STRONGLY DISAGREE	*DISAGREE*	*NEUTRAL*	*AGREE*	*STRONGLY AGREE*
42. When I get a recommended **CBE**, I feel good about myself.	1	2	3	4	5
43. When I get a **CBE**, I don't worry as much about breast cancer.	1	2	3	4	5
44. Having a **CBE** will help me find lumps early.	1	2	3	4	5
45. Having a **CBE** will decrease my chances of requiring radical or disfiguring surgery if breast cancer occurs.	1	2	3	4	5
46. Having a **CBE** will help me find a lump before it can be felt by myself.	1	2	3	4	5
47. Having a routine **CBE** would make me worry about breast cancer.	1	2	3	4	5
48. Having a **CBE** would be embarrassing.	1	2	3	4	5

49. Having a **CBE** would take too much time.	1	2	3	4	5
50. Having a **CBE** would be painful.	1	2	3	4	5
51. Having a **CBE** would cost too much money.	1	2	3	4	5

We are interested in <u>how much you agree or disagree</u> with the following statements concerning <u>mammography</u>. *(Please circle one number for each question even if you have NEVER had a mammogram)*

	STRONGLY DISAGREE	*DISAGREE*	*NEUTRAL*	*AGREE*	*STRONGLY AGREE*
52. When I get a recommended **mammogram** I I feel good about myself.	1	2	3	4	5
53.When I get a **mammogram**, I don't worry as much about breast cancer.	1	2	3	4	5
54.Having a **mammogram** of the breast will help me find lumps early.	1	2	3	4	5
55.Having a **mammogram** will decrease my chances of dying from breast cancer	1	2	3	4	5
56.Having a **mammogram** will decrease my chances of requiring radical or disfiguring surgery if breast cancer occurs.	1	2	3	4	5
57.Having a **mammogram** will help me find a lump before it can be felt by myself or a health professional.	1	2	3	4	5
58.Having a routine **mammogram** would make me worry about breast cancer.	1	2	3	4	5
59.Having a **mammogram** would be embarrassing.	1	2	3	4	5
60. Having a **mammogram** would take too much time.	1	2	3	4	5
61. Having a **mammogram** would cost too much money	1	2	3	4	5

The following questions will tell us about your health behaviors. (*Please circle one number)*

	STRONGLY DISAGREE	*DISAGREE*	*NEUTRAL*	*AGREE*	*STRONGLY AGREE*
62.I want to discover health problems early.	1	2	3	4	5
63.Maintaining good health is extremely important to me	1	2	3	4	5
64. I search for new information to improve my health.	1	2	3	4	5
65. I eat well balanced meals	1	2	3	4	5
66. I exercise at least 3 times a week	1	2	3	4	5
67. I have regular health check –ups even when I am not sick.	1	2	3	4	5

The following questions will tell us about your level of acculturation. Please choose the answer that best describes you. *(Please circle one number for each question)*

	ONLY FARSI	*FARSI BETTER THAN ENGLISH*	*BOTH EQUALLY*	*ENGLISH BETTER THAN FARSI*	*ONLY ENGLISH*
68. In general, what language(s) do you read and speak?	1	2	3	4	5
69. What was the language(s) you used as a child?	1	2	3	4	5
70. What language(s) do you usually speak at home?	1	2	3	4	5
71. What language(s) do you usually speak with your friends?	1	2	3	4	5

	ALL IRANIAN ETHNICS	*MORE IRANIAN ETHNICS THAN AMERICANS*	*ABOUT HALF AND HALF*	*MORE AMERICANS THAN IRANIAN ETHNICS*	*ALL AMERICANS*
72. Your close friends are:	1	2	3	4	5
73. The persons you visit or who visit you are:	1	2	3	4	5
74.You prefer going to social gatherings/parties at which the people are:	1	2	3	4	5

Before finishing the survey we would like to learn more about your background. Be assured that all the information you provide in this survey will be kept confidential.

75. Have you ever experienced the following regarding your breasts? *(Please circle one number)*

1. UNUSUAL PAIN, SWELLING OR LUMP
2. AN ABNORMAL MAMMOGRAM REQUIRING FURTHER TESTING
3. BOTH NUMBERS 1 AND 2
4. NONE OF THE ABOVE

76. Has anyone close to you ever been diagnosed as having breast cancer? *(Please circle one number)*

1.YES 2. NO

77. Have you ever been told you had breast cancer? *(Please circle one number)*

1.YES 2. NO

The next group of questions is about the <u>support</u> you may receive from your husband, family, and friends for having regular cancer screening. Please select one of the choices that best describes how you think or feel about their support.

78. How supportive is your <u>husband/partner</u> for you to get? *(Please circle one number)*

	HIGH	MODERATE	LOW	NEVER DISCUSS	NOT APPLICABLE
Breast Self-examination	5	4	3	2	1
Clinical breast-examination	5	4	3	2	1
Mammogram	5	4	3	2	1

79. How supportive are your <u>family /relatives</u> for you to get ? *(Please circle one number)*

	HIGH	MODERATE	LOW	NEVER DISCUSS	NOT APPLICABLE
Breast Self-examination	5	4	3	2	1
Clinical breast-examination	5	4	3	2	1
Mammogram	5	4	3	2	1

80. How supportive are your <u>friends</u> for you to get ? *(Please circle one number)*

	HIGH	MODERATE	LOW	NEVER DISCUSS	NOT APPLICABLE
Breast Self-examination	5	4	3	2	1
Clinical breast-examination	5	4	3	2	1
Mammogram	5	4	3	2	1

81. What was your age at your last birthday?_____ YEARS

82. What is your present marital status? *(Please circle one number)*

1. MARRIED
2. WIDOWED
3. DIVORCED/SEPARATED
4. NEVER MARRIED

83. What is the highest level of education that you have completed? *(Please circle one number)*

1. NO FORMAL EDUCATION
2. SOME GRADE SCHOOL
3. COMPLETED GRADE SCHOOL
4. SOME HIGH SCHOOL
5. COMPLETED HIGH SCHOOL
6. SOME COLLEGE
7. ASSOCIATES DEGREE
8. BACHELOR'S DEGREE
9. MASTERS DEGREE
10. DOCTORAL DEGREE

84. Are you presently: *(Please circle one number)*

1. EMPLOYED
2. UNEMPLOYED
3. RETIRED
4. FULL-TIME HOMEMAKER

85. How long have you lived in the United States? _____

86. Do you have health coverage? *(Please circle one number)*

1. YES 2. NO

87. Do you have a health care provider (doctor/nurse) whom you visit regularly? *(Please circle one number)*

1. YES 2. NO

88. What is the gender of your primary health care provider (doctor/nurse)? *(Please circle one number)*

1. MALE 2. FEMALE

89. In which language do you and your primary health care provider (doctor/nurse) communicate?

1. ENGLISH
2. FARSI
3. OTHER_____

90. What do you think are the best approaches to communicate information about breast cancer and screening services to people with a background like you? (Please circle all that apply)

1. HEALTH EDUCATION IN CLINIC SITE
2. HEALTH EDUCATION IN YOUR COMMUNITY
3. TV
4. RADIO
5. MAGAZINE
6. INTERNET
7. MAIL
8. E-MAIL
9. OTHERS_____

91. As part of this research it helps to get a picture of the general financial situation of all the study participants. Which of the following categories best describes your total annual household income? *(Please circle one number)*

1. LESS THAN $10,000
2. $ 10,000 TO $ 19,999
3. $ 20,000 TO $ 29,999
4. $ 30,000 TO $ 39,999
5. $ 40,000 TO $ 49,999
6. $ 50,000 TO $ 74,999
7. $ 75,000 TO $ 99,999
8. $100,000 AND OVER

92. We welcome any additional comments you may have. *(Please use the space provided below for your comments)*

Your contribution to this effort is greatly appreciated. THANK YOU!!