

**Cultural Beliefs among Latinas: The Role of Acculturation  
and Impact on Timeliness of Breast Cancer Care**

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THESIS

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This thesis is dedicated to my mother, Geri, without whom it would not have been accomplished. Thank you for the countless sacrifices you have made for my education and for always believing in me and pushing me to do my best. I am truly blessed to have your unconditional love and support.

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## **LIST OF ABBREVIATIONS**

BCCC	Breast Cancer Care in Chicago
NHW	Non-Hispanic White
SES	Socioeconomic Status
UIC	University of Illinois at Chicago



## SUMMARY

Certain cultural beliefs related to breast cancer may act as a barrier to a woman seeking breast cancer preventive services or timely follow-up for a breast symptom. For Latinas, holding beliefs that are inconsistent with healthcare-seeking behavior may lead to low or delayed utilization of care regardless of access. This study explores factors associated with breast cancer beliefs among Latina women and how this might lead to delays in seeking care or receiving treatment for breast cancer.

Data were obtained from a population-based sample of 181 urban Latina women recruited as part of the Breast Cancer Care in Chicago (BCCC) study. Women were ages 30–79 and had been diagnosed with primary in situ or invasive breast cancer. Interviews included a 15-item cultural beliefs scale spanning a range of beliefs regarding the meaning of a breast lump, importance of treatment, and the role of faith—beliefs that could be inconsistent with motivation to seek timely healthcare. The total number of beliefs was dichotomized at the sample mean, such that patients holding three or more beliefs (index) were compared to patients holding fewer than three beliefs (referent). Sociodemographic, socioeconomic, acculturation, and access/care utilization factors were examined as potential confounders of the association between cultural beliefs and delay. Three outcomes were examined: patient delay, clinical delay, and total delay. Patient delay was defined as the time from symptom self-detection by the patient to first clinical visit exceeding 30 days (sample median). Clinical delay was defined as the time from first clinical visit to first breast cancer treatment exceeding 60 days (sample median), and total delay was defined as the time from initial symptom detection (self-detected or clinically detected) to first treatment exceeding 90 days (sample median).

## **SUMMARY (continued)**

Seventy-five percent of women held one or more beliefs. The belief most commonly held was, “Faith in God can protect you from breast cancer” (48%). Fifty percent of the sample had an acculturation score of zero (Mean=1). Lower acculturation was associated with greater beliefs: patients who were older, born outside the United States, did not speak English as a primary language, or whose parents were less educated or born outside the United States tended to hold more beliefs ( $p<.05$ ). Patients with less income, less education, and lacking private health insurance also tended to hold more beliefs ( $p<.05$ ). Both clinical delay (57% versus 43%,  $p=.07$ ) and total delay (59% versus 32%,  $p=.0005$ ) were more common for women holding three or more beliefs versus two or less. After adjusting for age, education, income, and acculturation, holding three or more beliefs was associated with 3.35 times the odds of experiencing a total delay compared to holding two or less beliefs.

Cultural beliefs may predispose certain Latina women who are less acculturated and of lower socioeconomic status (SES) to prolong seeking care for breast symptoms and may influence delays in receiving treatment for breast cancer.

## **I. INTRODUCTION**

### **A. Latinos in the United States**

The term “Hispanic or Latino” refers to any person of Mexican, Puerto Rican, Cuban, Dominican, or South or Central American descent, or a person who is a member of any Spanish-speaking culture regardless of race (Ennis et al., 2011). The 2010 US Census indicated that in 2010 there were 308.7 million people living in the United States, of which 16% were Hispanic or Latino (50.5 million) (Ennis et al., 2011). The Latino population increased by 43% from 2000 to 2010, accounting for more than half of the total US population increase. The Mexican population experienced the largest increase of any Latino group with 54% growth and accounted for 75% of the Latino population increase (Ennis et al., 2011). In 2010, people of Mexican origin made up the largest group of Latinos in the United States, presenting 63% of the total US Latino population (Ennis et al., 2011). Puerto Ricans comprised the second largest group at 9% and the third largest were Cubans, making up 4% of the Latino population (Ennis et al., 2011). In 2010, Latinos made up 16% of the Illinois population, a growth of 33% from 2000. Illinois has the fifth largest Latino population and fourth largest Mexican population in the United States (Ennis et al., 2011). The city of Chicago has the fifth largest Latino population out of all US cities and 38% of the Illinois Latino population resides in Chicago (Ennis et al., 2011). Based on census bureau reports it is evident that the Latino population in the United States and in Chicago is growing rapidly and due to this rapid increase it is important to understand the health challenges they face.

The Latino population in both the United States and Illinois may be growing but Latinos consistently have lower SES than non-Hispanic Whites (NHW). In 2009, only 13% of Latinos had a bachelor’s degree or higher compared to 31% of NHW (Chavez et al., 1995). Furthermore,

23% of Latinos lived in poverty compared to 9% of NHW (Chavez et al., 1995). Latinos are the least of any racial/ethnic group to have insurance and are more likely to be unemployed (Chavez et al., 1995). Among Latinos, socioeconomic differences exist between ethnic subgroups. Cubans tend to be more highly educated, have higher incomes, and are much less likely to be uninsured than other Latino subgroups (Ramirez et al., 2000b). In comparison to Dominicans, Mexicans tend to be less educated, less likely to have a usual source of care, and are less likely to be insured (Garbers et al., 2003). The terms *Hispanic* and *Latino* are often used interchangeably in the literature. For consistency purposes the term Latino will be used in the remainder of this study; however, studies referenced may have used either term.

#### B. **Latinas and Breast Cancer**

Breast cancer is the most common cancer among US women (29% of all cancers in women), and the second most common cause of cancer-related death in US women (14% of cancer deaths in women) (American Cancer Society, 2013). Among Latinas, breast cancer is the most common cancer, with an estimated 17,000 new breast cancer cases in 2012, and is the number one cause of cancer-related death, with 2,400 estimated deaths in 2012 (15% of cancer-related deaths in Latina women) (American Cancer Society, 2012a). Although Latinas are less likely than NHW women to be diagnosed with breast cancer, they are more likely to be diagnosed under the age of 50 (Miranda et al., 2011b; Hedeem, and White, 2001; Li et al., 2003; Ooi et al., 2011), with larger tumors (Li et al., 2002; Hedeem, and White, 2001; Li et al., 2003; Ooi et al., 2011), and are less likely to be diagnosed at localized stages and more likely to be diagnosed at stage III or IV (Li et al., 2002; Hedeem, and White, 2001; Li et al., 2003; Ooi et al., 2011).

Mexican and Puerto Rican women in particular are at increased risk of late stage diagnosis (Ooi 2011). From 2005 to 2009, only 56% of Latina breast cancer cases were diagnosed in localized stage compared to 64% of NHW cases (American Cancer Society, 2012b). Furthermore, Latinas are more likely to be diagnosed with more aggressive and faster-progressing tumors that are hormone receptor negative (Li et al., 2002; Hines et al., 2011; Li et al., 2003; Ooi et al., 2011). Mexican (Li et al., 2003; Ooi et al., 2011) and Puerto Rican women (Li et al., 2003) are more likely to receive inappropriate treatment for stage I and II breast cancer, and Latina women overall are more likely than NHW to have lower disease specific five-year survival rates (Frost et al., 1996). Compared to NHW, Latina women have higher breast cancer specific mortality, even after adjusting for age at diagnosis, stage, hormone receptor status, receipt of surgical treatment and radiation therapy, and SES (Li et al., 2003; Ooi et al., 2011).

Reductions in breast cancer mortality and improvements in stage at diagnosis have been linked to an increase in mammography screening rates (Stockton et al., 1997). Women who underutilize mammography screening services have higher rates of self-detected breast cancer, which is associated with a later stage at diagnosis and decreased survival (Spillane et al., 2001). Women whose breast cancers are screen-detected have improved five-year and overall survival compared to women with self-detected, symptomatic breast cancers (Spillane et al., 2001). In 2010, 67% of US women reported receiving a mammogram in the previous two years; however, women who were uninsured consistently reported lower rates of screening, with only 31% reporting a mammogram in the previous two years and 17% in the previous year (American Cancer Society, 2012b). Additional screening differences by race/ethnicity exist, with Latina women reporting some of the lowest screening rates of any group (Miranda et al., 2011a; Ramirez et al., 2000a; Ramirez et al., 2000b). In 2010, 64% of Latina women 40 years of age and

older and 67% of NHW women 40 years of age and older reported having a mammogram in the past two years (American Cancer Society, 2012b). Similarly, in 2010 only 47% of Latina women age 40 or older had a mammogram within the past year compared to 52% of NHW women (American Cancer Society, 2012b). Mexican women have the lowest mammography screening rates of any Latina subgroup and are more likely to have never had a mammogram than African American, NHW, and other Latina women (Miranda et al., 2011a).

Latina women face several barriers to screening and health-seeking behaviors, including economic, access, and cultural barriers. The likelihood that a woman is compliant with recommended mammography screening guidelines is influenced by a variety of factors. Women who are ages 50–64 (Ramirez et al., 2000a; Mack et al., 2009), are insured (Ramirez et al., 2000a; Tejeda et al., 2009; Garcia et al., 2012; Mack et al., 2009), have a usual source of care (Mack et al., 2009), and have a higher SES (Mack et al., 2009; Ramirez et al., 2000a) are more likely to be screening compliant. On the other hand, women who do not speak English (Ramirez et al., 2000a; Jacobs et al., 2005; Garcia et al., 2012), are less acculturated (Garcia et al., 2012; Mack et al., 2009), and have a low perceived risk of breast cancer due to lack of knowledge about symptoms (Tejeda et al., 2009) are less likely to be compliant with recommended mammography screening practices. Furthermore, women who are less acculturated, primarily speak Spanish, and are younger are more likely to self-detect breast cancer (Garcia et al., 2012).

### C. **Beliefs, Knowledge and Misconceptions about Breast Cancer**

Low levels of knowledge and high levels of misconceptions about the risk factors, symptoms, diagnosis, and treatment of breast cancer are prevalent among Latina women (Fernandez et al., 1998; Schettino et al., 2006; Perez-Stable et al., 1992; Morgan et al., 1995;

Hubbell et al., 1996; Shankar and Figueroa-Valles, 1999; Carpenter and Colwell, 1995; Koval et al., 2006). Furthermore, Latina women are more likely than NHW women to hold beliefs about breast cancer that are inconsistent with the motivation to seek care for a self-detected symptom, such as: there is not much you can do to prevent breast cancer; it is better to not know if you have breast cancer; or that a mammogram is only needed when you have a breast lump (Hubbell et al., 1996). The association between Latina ethnicity and a higher likelihood of holding these types of beliefs remains significant even after controlling for demographic factors like age, education, employment, income, and insurance (Hubbell et al., 1996; Perez-Stable et al., 1992). A study by Rauscher et al. (2010) found that Latina women are more likely to hold misconceptions about breast lumps than both NHW and Black women. Only 5% of NHW and 18% of Black women held one or more misconceptions about breast lumps compared to 38% of Latina women (Rauscher et al., 2010).

The misconceptions or beliefs about breast cancer that are commonly held by Latinas include beliefs about:

1. Things that can cause breast cancer to occur or spread, such as trauma or bruises (Carpenter and Colwell, 1995; Morgan et al., 1995; Shankar and Figueroa-Valles, 1999; Shelton et al., 2011; Goldman and Markham Risica, 2004; Chavez et al., 1995); surgery or cutting into a tumor (Morgan et al., 1995; Shankar and Figueroa-Valles, 1999); vice and immoral behavior like promiscuity and drug use (Shelton et al., 2011; Goldman and Markham Risica, 2004; Chavez et al., 1995); carelessness or *descuido* (carelessness, negligence, oversight) (Luquis and Villanueva Cruz, 2006; Goldman and Markham Risica, 2004); breast feeding

- (Luuqis and Villanueava Cruz, 2006; Goldman and Markham Risica, 2004); and radiation and trauma from screening procedures (Simon, 2006);
2. Signs and symptoms of breast cancer, such as pain (Schettino et al., 2006);
  3. Mammography screening and other methods to detect breast cancer (Schettino et al., 2006; Shelton et al., 2011); and
  4. General beliefs about cancer, such as cancer is a death sentence and is not preventable (Shankar and Figueroa-Valles, 1999; Perez-Stable et al., 1992; Luquis and Villanueva Cruz, 2006; Simon, 2006); Latinos are more likely to get cancer than Whites (Shankar and Figueroa-Valles, 1999); or that cancer is God's will or punishment (Perez-Stable et al., 1992; Shelton et al., 2011; Simon, 2006).

Overall, the Latina belief model of breast cancer risk emphasizes trauma to the breast and immoral behavioral that may adversely affect health such as drinking, excessive breast fondling, drug use, and poor hygiene, rather than emphasizing biological, genetic, or medical factors (Chavez et al., 1995).

Aside from Latino ethnicity, there are several factors that may influence the likelihood of holding misconceptions and unfavorable attitudes and beliefs related to breast cancer. Some of these factors include: age (Vaeth, 1993; Shankar and Figueroa-Valles, 1999; Ramirez et al., 2000b), being less educated (Vaeth, 1993; Shankar and Figueroa-Valles, 1999), income (Vaeth, 1993; Shankar and Figueroa-Valles, 1999), lacking insurance (Shankar and Figueroa-Valles, 1999; Ramirez et al., 2000b), personal history of breast cancer (Vaeth, 1993), language preference (Ramirez et al., 2000b), and being less acculturated (Hubbel et al., 1996). Studies on other chronic illnesses have found a similar association between lower levels of acculturation



and higher levels of beliefs inconsistent with seeking care. A study on cardiovascular disease, beliefs, and acculturation by Edelman et al. (2009) found an association between being less acculturated and holding higher levels of beliefs that can act as a barrier to seeking care for cardiovascular disease. These beliefs emphasized God as an eternal locus of control of disease (i.e., when you get sick God can help you the most) (Edelman et al., 2009).

Barriers to breast cancer screening include both structural (insurance, cost, accessibility) and cultural factors (beliefs, language, lack of knowledge about screening recommendations, fear) (Chavez et al., 2001; Koval et al., 2006; Garbers et al., 2003). Latina women's breast cancer beliefs may discourage them from seeking regular mammography screening due to shame, especially beliefs that associate immoral or risky behaviors with cancer (Chavez et al., 2001). Furthermore, embarrassment about screening procedures and fear of a diagnosis is widespread among Latinas and can also act as a barrier (Goldman and Markham Risica, 2004; Luquis and Villanueva Cruz, 2006; Garbers et al., 2003). The added effect of these structural and cultural barriers may explain the persistently low levels of screening in the Latino community.

#### D. **Fatalism**

Fatalism is the belief that humans are powerless over the outcome of certain life events, such as a cancer diagnosis, and that the outcome of these events is often negative (Abraido-Lanza et al., 2007; Beeken et al., 2011; Espinosa de los Monteros and Gallo, 2011). Fatalism assumes that when a person is diagnosed with cancer it is a death sentence and there is nothing the individual can do to prevent it (Abraido-Lanza et al., 2007; Shelton et al., 2011; Shankar and Figueroa-Valles, 1999). On the other hand, the belief in an external locus of control, or a belief in divine control, lacks the negative assumptions of fatalism and believes in an outside force that

controls life events and their outcomes, whether they be positive or negative (Beeken et al., 2011; Umezawa et al., 2012). Latinos and African Americans are more likely than Whites to hold fatalistic beliefs and to believe in divine control (Umezawa et al., 2012; Espinosa de los Monteros and Gallo, 2011; Perez-Stable et al., 1992; Ramirez et al., 2000b). Furthermore, people who hold fatalistic beliefs are more likely to be less acculturated, have a lower SES, and decreased access to care (Espinosa de los Monteros and Gallo, 2011; Ramirez et al., 2000b). Lower acculturation is associated with an increased likelihood of holding fatalistic beliefs about cancer even after controlling for SES (Perez-Stable et al., 1992).

Fatalism may act as a barrier to preventive behaviors such as cancer screening (Espinosa de los Monteros and Gallo, 2011). Fatalistic beliefs are believed to be associated with a less positive attitude toward screening and increased levels of fear when seeking help for a symptom (Beeken et al., 2011). A review by Espinosa de Monteros and Gallo (2011) found that most of the literature on fatalism and mammography screening in Latinas reports a positive association between holding fatalistic beliefs and decreased usage of screening services after adjusting for acculturation, SES, and factors impacting access to care. It is possible, however, that beliefs sometimes interpreted as fatalistic may in fact be a belief in divine control, which might have positive associations with screening and may lead to resilient attitudes and positive coping mechanisms in the face of a cancer diagnosis (Florez et al., 2009; Drew and Schoenberg, 2011; Abraido-Lanza et al., 2007).

#### E. **Acculturation**

Traditionally, acculturation is defined as a process of cultural change that takes place when two culturally diverse groups come into long-term contact. This process involves the less

dominant culture adapting to the dominant culture's beliefs and values (Siatkowski, 2007). An expanded definition of acculturation argues that, especially among Latinos, acculturation is a complex process by which Latinos who migrate to the United States adapt to the language, beliefs, behaviors, and attitudes of the dominant American culture while maintaining their own (Siatkowski, 2007). Acculturation level is measured in many different ways; however, the most common methods of measuring acculturation emphasize language preference and length of residency in the United States (Siatkowski, 2007; O'Malley et al., 1999; Abraido-Lanza et al., 2005). While these methods are common, they completely neglect other important cultural factors that can influence the process of acculturation and subsequent healthcare-seeking behaviors. Some of these factors include: education, family dynamics, country of origin, age at immigration, parental education, and parental country of origin (Siatkowski, 2007). Compared to Latinas who are highly acculturated, Latinas who are less acculturated are more likely to be older, have immigrated at an older age to the United States, be less educated, have a lower household income, be uninsured, and lack a regular source of care (Siatkowski, 2007; O'Malley et al., 1999).

One of the primary reasons for studying acculturation is to understand its influence on health- and illness-related beliefs and health-seeking behavior. Higher acculturation has been shown to be associated with increased adherence to medical advice and treatments, while lower acculturation has been associated with decreased use of screening services (Siatkowski, 2007). The role of acculturation in mammography use among Latina women has been widely investigated. Higher acculturation status has been linked to an increased likelihood of recently receiving a mammogram (O'Malley et al., 1999; Abraido-Lanza et al., 2005). O'Malley et al. (1999) found that even after adjusting for age, education, income, insurance, and having a usual

source of care, a higher acculturation status was associated with greater odds of ever and recently receiving a mammogram. These studies highlight the importance of considering acculturation when conducting health outcomes research in Latino populations (Siatkowski, 2007).

#### F. **Delay**

Delay is often defined and measured in several different ways; however, Pack and Gallo (1938) originally defined two main types of delay: patient delay and provider delay. Patient delay is defined as a delay of three months or more from symptom discovery by the patient to first medical visit (Pack and Gallo, 1938). Provider delay is defined as a delay exceeding one month from first medical visit to the initiation of cancer treatment (Pack and Gallo, 1938). The cutoffs for delay were set rather arbitrarily by taking the median delay in the sample. Provider delay has been studied a lot less than patient delay and there is a gap in the literature on this topic, in particular related to clinical and system factors that impact provider delay (Facione, 1993). A third type of delay, total delay, is frequently used in the literature as well. Total delay is defined as a delay greater than three months from symptom detection and the initiation of treatment (Unger-Saldaña and Infante-Castañeda, 2008).

On average, 20%–35% of breast cancer patients delay seeking care for a breast symptom three or more months (Facione, 1993; Lauver et al., 1995; Richards et al., 1999b). There are several well-documented risk factors for patient delay, including: factors related to a patient's SES such as education, insurance, cost of medical care, and underutilizing care even when it is available (Unger-Saldaña and Infante-Castañeda, 2008; Friedman et al., 2006; Richardson et al., 1992; Gullatte et al., 2006; Garcia et al., 2012); factors related to symptoms of breast cancer such as lacking knowledge about symptoms, having a symptom other than a breast lump, or not

perceiving a symptom to be serious (Unger-Saldaña and Infante-Castañeda, 2008; Gullatte et al., 2006; Friedman et al., 2006; Burgess et al., 1998; Facione, 1993; Nosarti et al., 2000; Garcia et al., 2012). In addition, failing to disclose the discovery of a symptom to another person is associated with an increased likelihood of a patient delaying in seeking care (Gullatte et al., 2006; Burgess et al., 1998). Additional factors such as older age (Gullatte et al., 2006; Ramirez et al., 1999), low levels of trust in healthcare providers (Blanchard and Lurie, 2004), fear (Gullatte et al., 2006; Nosarti et al., 2000), being less acculturated, and speaking Spanish (Garcia et al., 2012) have also been linked to patient delays in seeking care for breast symptoms.

Provider delay was originally defined by Pack and Gallo (1938) as a delay exceeding one month from the time of first medical visit to the initiation of treatment. Provider delay, sometimes referred to as system or clinical delay, has been understudied in comparison to patient delay due to a trend in the medical literature of holding individuals and their negative behaviors accountable for poor health outcomes (Unger-Saldaña and Infante-Castañeda, 2008). The few studies that have focused on delays in the time from when a woman receives her first medical visit to when she begins treatment typically highlight variables related to the patient (i.e., failing to schedule follow-up appointments in a timely manner or missing appointments) (Unger-Saldaña and Infante-Castañeda, 2008) or to the doctor, such as false negative screening results or medical error due to a patient being younger or having a symptom other than a breast lump (Ramirez et al., 1999; Burgess et al., 1998; Facione, 1993).

Diagnostic delay is a variation of provider delay and is defined as an excessive delay in the time between first symptom and diagnosis (Ashing-Giwa et al., 2010). Studies on breast cancer diagnostic delay often focus on racial/ethnic disparities in diagnostic time. Racial/ethnic minorities, in particular Latina and African American women are more likely to experience

diagnostic delays compared to NHW women (Stuver et al., 2011; Gwyn et al., 2004; Press et al., 2008; Ramirez et al., 2013; Hoffman et al., 2011). These differences often persist even after adjusting for age, insurance status, education, and income (Stuver et al., 2011; Press et al., 2008; Ramirez et al., 2013; Hoffman et al., 2011; Gwyn et al., 2004). Therapeutic delay, a second variation of provider delay, is defined as an excessive delay in the time from diagnosis to the initiation of treatment (Ashing-Giwa et al., 2010). Similar to diagnostic delays, race/ethnicity is a key predictor of therapeutic delays, even after adjusting for SES (Ashing-Giwa et al., 2010). Patient and provider delays are caused by complex interactions between a patient's SES, cultural context, access to care, quality of available care, and a patient's beliefs and knowledge of breast cancer (Unger-Saldaña and Infante-Castañeda, 2011).

#### G. **Delay, Stage, and Survival**

The most important reason for studying delay is due to its impact on breast cancer stage at diagnosis and survival. Patient delays, treatment delays, and total delays exceeding three months are associated with significantly decreased survival and increased mortality (Bish et al., 2005; Gullatte et al., 2006; Richards et al., 1999a). The association between delay and decreased survival is likely due to an association between delay and disease progression or advanced stage at diagnosis (Unger-Saldaña and Infante-Castañeda, 2008; Facione, 1993; Richards et al., 1999a; Richards et al., 1999b). As length of delay increases, stage at diagnosis increases (Facione, 1993; Richards et al., 1999a; Wilkinson et al., 1979; Richards et al., 1999b) and as stage at diagnosis increases, survival decreases (Wilkinson et al., 1979). Richards et al. (1999b) found that 32% of patients who delayed 12 weeks or more to seek care for a breast symptom had locally advanced or metastatic disease compared to only 10% of women who delayed less than 12 weeks.

## H. **Impact of Beliefs on Delay**

The influence of beliefs on delay has not been well studied; however, there are a few studies that have explored this concept to some extent. A study by Lannin et al. (1998) found that socioeconomic factors alone did not sufficiently explain the impact of race/ethnicity on breast cancer stage at diagnosis; however, socioeconomic factors combined with cultural beliefs and attitudes toward cancer accounted for most of the observed differences between races. Furthermore, women who held fatalistic or cultural beliefs were more likely to be diagnosed at later stages of disease (Lannin et al., 1998). Gullatte et al. (2010) analyzed the influence of highly religious and fatalistic beliefs on delay in seeking care for a self-detected breast symptom among African American women. They found that beliefs about God and fatalism were not significantly associated with patient delay (Gullatte et al., 2010).

A study by Rauscher et al. (2010) that used the same BCCC data set utilized in the current study, explored the impact of breast lump misconceptions on patient delay. In the study by Rauscher et al. (2010), misconceptions were defined as cultural beliefs that may act as a barrier to a woman seeking healthcare, or beliefs that may be inconsistent with the motivation to seek timely healthcare. Three misconceptions about breast lumps were significantly associated with prolonged patient delay: “You only need to get a lump checked if it’s painful” (38% versus 14%), “You only need to get a lump checked if it gets bigger” (28% versus 14%), and “Pressing a lump will cause it to be breast cancer” (30% versus 14%) (Rauscher et al., 2010). These misconceptions about breast lumps were more prevalent among minority women who had less access to care resources and who were of a lower SES (Rauscher et al., 2010). Latinas and African American women were significantly more likely to report holding one or more breast lump misconception compared to White women (38% versus 18% versus 5% respectively,

P<.0001) (Rauscher et al., 2010). The likelihood of holding one or more breast lump misconceptions increased with older age, lower income and education, and lack of private insurance and a regular provider (Rauscher et al., 2010).

## I. **Current Study**

Previous studies have linked a woman's beliefs to underutilization of screening services and delays in seeking care for a self-detected breast symptom; however, there is a gap in the literature on the association between Latina women's cultural beliefs and their receipt of timely breast cancer care. To the best of my knowledge, this is the first study to quantify cultural beliefs in a population of Latina breast cancer patients using a validated and reliable scale and to analyze the relationship between cultural beliefs and delays in both seeking care for a breast symptom and receiving treatment. Furthermore, this study is one of the few to assess the influence of patient-level factors (i.e., cultural beliefs and acculturation) on delays that occur after the first medical visit. This study aims to: (1) describe the characteristics of an urban Latina breast cancer patient population; (2) explore the breast cancer-related beliefs held by this population and the factors associated with Latina women holding a greater number of breast cancer-related cultural beliefs; and (3) analyze the relationship between a woman holding a higher number of cultural beliefs and delaying in seeking medical care or receiving treatment. My hypothesis is that women who hold a higher number of cultural beliefs will have greater odds of both delaying in seeking care for a breast symptom (patient delay) and in receiving treatment for breast cancer.



## II. METHODS

### A. Data Source

Data for these analyses come from the BCCC study. The BCCC was a population-based sample of 989, NHW, African American, and Hispanic women recently diagnosed with breast cancer. In order to be eligible, women had to be diagnosed with a first primary in situ or invasive breast cancer between 2005 and 2008; diagnosed between the ages of 30 and 79; speak either English or Spanish; and reside in Chicago at the time of their diagnosis. Details regarding the study protocol and recruitment have been previously published (Rauscher et al., 2010; Kaiser et al., 2010; Rauscher et al., 2013). Briefly, all newly diagnosed breast cancer cases were identified at 56 Chicago hospitals by certified tumor registrars employed by the Illinois State Cancer Registry. Registrars reviewed hospitals' tumor registries and pathology records on a monthly basis to identify eligible patients. Within one to three months of diagnosis, the Illinois State Cancer Registry invited all eligible women to participate by mailing them a brochure and a letter in English and Spanish describing the study. Women were given the opportunity to either call or return a postcard indicating their willingness to participate or their refusal to participate. If a woman did not respond within ten days after first contact, she was recontacted by either mail or telephone.

Once a woman was successfully contacted, she was referred to the University of Illinois at Chicago (UIC) Survey Research Lab where she was screened for eligibility and scheduled for an in-person interview. Any woman who was not interested in participating at that time was recontacted two months later. Women received written informed consent prior to the interview and all patients who completed the survey received a \$100 incentive for their participation.

Surveys were administered in either English or Spanish using laptop computer-assisted personal interviewing procedures and included questions pertaining to the process of discovery, diagnosis, and treatment that each woman experienced relating to her breast cancer. All study procedures received prior approval from the UIC Institutional Review Board (Rauscher et al., 2010; Kaiser et al., 2010; Rauscher et al., 2013). The overall study response rate was 56% (Rauscher et al., 2010), meaning that almost half of the eligible patients who were contacted chose not to participate. Participants were more likely than nonparticipants to be Hispanic (16% versus 13%) (Rauscher et al., 2010). The analyses presented here used the subset of 181 Latina women who participated in the BCCC study.

**B. Survey Instrument: Breast Cancer Beliefs Scale**

The Breast Cancer Beliefs Scale was developed to measure cultural beliefs that might contribute to late-stage diagnosis in African American, NHW, and Hispanic women that were part of the BCCC study. It consists of 17 items covering a range of beliefs that could be inconsistent with the motivation to seek timely healthcare. All 17 questions have a true or false response option and span a range of beliefs including: beliefs that make women feel less vulnerable to breast cancer; beliefs that might discourage a woman from seeking breast cancer screening services; beliefs about breast lumps; and beliefs about the efficacy of breast cancer treatment. The complete version of the Breast Cancer Beliefs Scale is attached (see Appendix).

The scale was developed by doing an extensive review of the literature and identifying beliefs that were associated with the above-mentioned areas of interest. To test the validity and reliability of the instrument, beliefs were verified with both African American and Latina community partners as a way of identifying any additional beliefs that should be included. The

identified beliefs were scaled down to 17 items and tested in a series of four focus groups. Individual focus groups were held with White women, African American women, English-speaking Latinas, and Spanish-speaking Latinas respectively. The instrument was revised based upon focus group input and then tested using cognitive interviews with African American women, English-speaking Latinas, and Spanish-speaking Latinas. The content of the scale was found to be meaningful to the respondents and interpreted as intended by the investigators. The scale demonstrated reliability with a Cronbach's alpha of 0.73 and validity for the four populations tested. Women tend to score significantly different on the scale based on their self-reported race/ethnicity (Ferrans et al., 2007a; Ferrans et al., 2007b).

Fifteen of the 17 items from the scale were analyzed in this study. Two items were excluded due to poor inter-item correlation. The two excluded items are: If a woman is poor, she won't get cured from cancer, because she won't get the best treatment (item 15); and If breast cancer is treated correctly, it can be cured (item 16). The remaining 15 items had an inter-item correlation of 0.82.

### C. **Dependent Variables**

Patients were asked the question "Now let's talk about the problem that turned out to be breast cancer. How was the problem noticed for the very first time?" with the following response categories: (a) I found something, or my partner/spouse found something (defined as symptomatic detection); (b) A doctor or nurse found something during a physical exam (defined as clinical detection); or (c) on Mammogram, an ultrasound, an MRI, or on a lung/chest x-ray (defined as radiologic detection). Nearly all patients (95%) reported either self-detection or detection through a mammogram. Regardless of the method of initial detection, patients were

then asked to report the month and year of their initial detection (e.g., March 2006). All patients were then asked a series of questions pertaining to their diagnostic work-up, including exact dates and locations of care, and what took place at each visit (e.g., physical exam, mammogram, ultrasound, MRI, biopsy). Patients who reported symptomatic detection reported their date of medical presentation (date of their first doctor's visit for the problem). Patients were later asked to report whether they had any surgery for breast cancer and the type of surgery(s) and date(s), as well as whether they had radiation, chemotherapy, or hormone therapy, and the corresponding date of initiation for each.

In the present study, three main outcome variables were analyzed: patient delay, clinical delay, and total delay. Prolonged patient delay is defined as a delay from self-detection, or symptom awareness, to first medical presentation exceeding 30 days (sample median). In the majority of cases, the first medical visit was with a primary care physician. Prolonged clinical delay, also known in the literature as provider delay, is defined as a delay from first medical presentation to first therapeutic intervention for breast cancer (surgery, radiation, chemotherapy, or hormone therapy) exceeding 60 days (sample median). If breast cancer was screen detected, then clinical delay is measured beginning at the date of the screening mammogram. Finally, prolonged total delay is defined as a delay from initial symptom detection (self-detected or clinically detected) to first treatment exceeding 90 days (sample median). Figure 1 shows a pictorial description of the three outcome variables. The definitions and cutoffs of the three types of delay were set based on the precedent established by Pack and Gallo (1938), who defined prolonged patient and provider delay by taking the median delay in the sample. All three types of delay were measured using patient self-reported data. Patients had the option of reporting delays in days, weeks or months and all responses were later rounded to days.

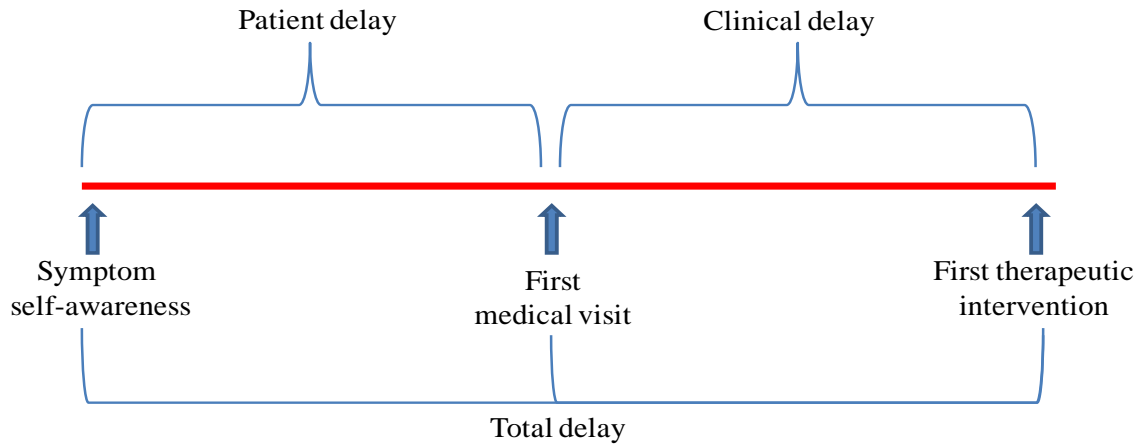


Figure 1. Types of delay along the breast cancer care continuum.

#### D. **Independent Variable: Cultural Beliefs Inconsistent with Seeking Care**

Due to the small size of the sample, the total number of cultural beliefs was dichotomized at the sample mean, such that women holding three or more beliefs (sample mean) out of a total of 15 beliefs were compared to the referent group of women holding fewer than three beliefs. Further analysis was conducted using a continuous version of total number of cultural beliefs, ranging from a score of 0 to 15.

#### E. **Covariates**

A woman's cultural beliefs, in particular those related to health and healthcare, are complex and influenced by a variety of factors including: demographics, sociocultural context, and access to high-quality healthcare. In this analysis, potential sociodemographic, socioeconomic, acculturation, and healthcare access and utilization predictors were examined.

## 1. **Sociodemographic factors**

Patient's age was used as an ordinal variable and categorized as <50 years, 50–59 years, and  $\geq 60$  years. Latino ethnicity was determined using a two step-process. First women were asked whether they considered themselves to be of Hispanic/Latino origin. Those who replied yes were then asked whether they considered themselves to be Cuban, Mexican, or Mexican-American, Puerto Rican, or other. In this analysis, women were categorized as Mexican or other due to sample size considerations.

Women were asked whether their biological mother, any of their biological sisters, or daughters had been diagnosed with breast cancer and, if yes, how many had been diagnosed, and whether any of them were diagnosed before the age of 50. Based on this information, three family history categories were developed. No family history was defined as not having a first-degree relative with diagnosed breast cancer; women with only one first-degree relative diagnosed with breast cancer after the age of 50 were coded as a moderate level of family history; and a high level of family history was defined as having multiple first-degree relatives with a history of breast cancer or one or more first-degree relatives with early onset disease.

## 2. **Socioeconomic status**

Education was treated as an ordinal variable and categorized as less than a high school degree (<12 years), a high school degree (12 years), or greater than a high school education ( $\geq 13$  years). In addition, women were asked to report their total household income for 2006, considering income from all sources before taxes. Income was defined as an ordinal variable for analyses and categorized as  $\leq \$20,000$ ,  $\$20,000$ – $\$50,000$ , and  $> \$50,000$ . Two measures were created to capture neighborhood SES using data derived from the 2000 US

Census: concentrated disadvantage and concentrated affluence. Concentrated disadvantage was defined as the percentage of individuals below the poverty line; families receiving public assistance; female-headed households with children; and persons unemployed. Concentrated affluence combined measures for percentage of families with incomes of \$100,000 or more; civilian labor force in professional and management-level occupations; and adults with a college education or higher. Disadvantage (Cronbach's  $\alpha=.84$ ) and affluence (Cronbach's  $\alpha=.95$ ) were defined by creating an equally weighted sum across the relevant combination of variables, then standardizing the sum to have a mean of zero and a standard deviation of one. Dichotomous versions of disadvantage and affluence were defined by coding all those who had a standardized concentrated disadvantage or affluence level above the mean of zero as having a high level of disadvantage or affluence.

### 3. **Acculturation**

Women were asked to report their country of birth: United States, Mexico, Puerto Rico, or other. Due to small sample size, the categories Mexico, Puerto Rico, and other were combined into a single category and country of birth was coded as continental United States or other. Biological mother's and father's countries of origin were similarly coded as continental United States or other. Women reported the primary language they spoke at home: English, Spanish, or other. For the purpose of this analysis, primary spoken language was dichotomized as English or other. Mother's and father's education was treated as an ordinal variable and categorized as less than a high school degree (<12 years), a high school degree (12 years), or greater than a high school education ( $\geq 13$  years).

In order to measure cultural isolation, we created an index variable that combined three census tract measures taken from the 2000 U.S. Census: (1) the percent of Hispanic/Latino persons living in the same census tract as the patient; (2) the percent of people in that census tract who were born outside the United States; and (3) the percent of households that were linguistically isolated, defined as households whose members 14 years and older spoke a language other than English and no members spoke English “very well” (Siegel et al., 2001). These three measures were standardized and then summed to create a score (Cronbach’s  $\alpha=.91$ ) that was itself standardized to have a mean of zero and a standard deviation of one. A dichotomous cultural isolation variable was created by coding all those who had a standardized concentrated cultural isolation level above the mean of zero as having a higher level of cultural isolation.

A woman’s acculturation level was measured by using a combination of six variables: primary language spoken by the patient (English=1 or other=0); her country of origin (United States=1 or other=0); her mother’s country of origin (United States=1 or other=0); her father’s country of origin (United States=1 or other=0); her mother’s level of education (high school and greater=1 or less than high school=0); and her father’s level of education (high school and greater=1 or less than high school=0). Women received one point for each response that indicated a higher acculturation level and the scores for all six variables were summed. All women were given an acculturation score ranging from zero to six, six being the highest level of acculturation and zero being the lowest. Women who did not speak English, who were foreign born, who had a foreign-born mother and father, and whose parents both had less than a high school education received an acculturation score of zero. Women who spoke English, who were born in the United States, whose mother and father were both born in the United States, and



whose parents both had at least a high school education were given a score of six. For the purpose of some analyses, a dichotomous acculturation variable was created by splitting acculturation score at the sample mean such that lower acculturation was defined as a score of zero (sample mean), and higher acculturation was defined as a score of one or more.

#### 4. **Healthcare access and utilization**

Women were asked about their insurance status at the time when the problem that turned out to be breast cancer was discovered. Women reported whether they had coverage under Medicare, Medicare Part B, Medigap, Medicaid, military health insurance, or some form of private insurance. Women were defined as having private insurance if they reported any form of private insurance, including supplemental insurance, in addition to Medicare (e.g., Medigap). Patients were categorized as either having or not having a regular healthcare provider based on their response to the question, “Think back to the time before the problem was discovered that turned out to be cancer. Around that time, did you have a doctor or healthcare person that you thought of as your own doctor, someone you went to regularly for care?”

Women self-reported the timing of their most recent routine physical exam, clinical breast exam, and mammogram, prior to becoming aware of the problem that was later diagnosed as breast cancer. Women were asked whether their last physical exam “where they undressed and a medical person examined them from head to toe” took place in the previous 12 months, past two years, more than two years ago, or never. Next, women were asked whether their last clinical breast exam where their breasts “were checked for lumps by a medical professional” took place in the previous 12 months, past two years, more than two years ago, or never. Finally, patients

were asked to recall if their most recent mammogram prior to breast cancer discovery took place in the last 12 months, last two years, more than two years ago, or never.

Patient's trust in their primary care providers was defined using the 11-item Trust in Physician Scale (Anderson and Dedrick, 1990). If a patient reported not having a regular provider, then the questions were asked with respect to their regular place for preventive or sick care. Each item was recorded on a five-point Likert scale (strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree). The items were oriented such that higher scores corresponded to less trust and summed to create a variable with a theoretical range of 11 (greatest amount of trust) to 55 (least amount of trust). Figure 2 depicts a conceptual model of the association between cultural beliefs and delay and the different domains of covariates that are hypothesized to influence this association.

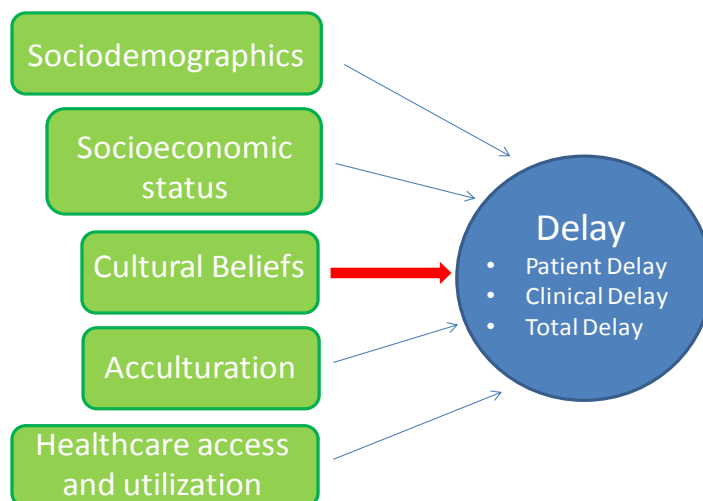


Figure 2. Conceptual model of the association between cultural beliefs and delay.

## F. **Statistical Analysis**

All analyses were conducted using SAS version 9.3. After examining the distribution of each variable, contingency table analyses were conducted to examine the crude association between candidate covariates (i.e., potential demographic, sociocultural, parental, and access to care factors) and cultural beliefs, patient delay, clinical delay, and total delay. Univariable analyses were conducted to explore the crude relationship between beliefs and each outcome variable, as well as to ensure sufficient numbers in each cell. Associations between each individual belief and acculturation status were assessed using chi-square tests. Additional chi-square tests were conducted to analyze the association between cultural beliefs and each of the three types of delay, as well as the association between each individual belief and each type of delay.

Preliminary model building steps included the construction of predictive logistic regression models of prolonged patient delay, clinical delay, and total delay using both a forward and backward automated model selection procedure with a liberal P-value of 0.25 to enter or stay in the model. Variables that were significantly associated with cultural beliefs and/or the delay outcome variables in crude analyses, as well as conceptually important variables, were initially entered in the model. Bivariate logistic regression models were used to assess confounding. Covariates that caused a change in the odds ratio greater than 10% were considered confounders of the association between cultural beliefs and delay. Conceptually important covariates (i.e., age, education, and income) were retained in the model regardless of whether they were true confounders by the conventional rule.

Multivariable logistic regression models were used to determine if an association between cultural beliefs and increased odds of delay remained after controlling for confounders. Results were obtained for an initial model fully adjusted for all covariates of interest based on preliminary model building steps and conceptually important covariates in the literature. Interaction terms between each covariate and cultural beliefs were included in a model to determine if there was any effect modification. If an interaction term showed statistical significance at alpha level of 0.05, it was retained in the model. Covariates were eliminated from the model in a backward selection fashion by eliminating the least significant covariates one at a time. Certain covariates of conceptual importance were later reentered into the model and retained in the final modeling results. The final model was selected based on conceptually important covariates and a need to preserve sample size while fully adjusting for confounding.

### III. RESULTS

#### A. Sample Characteristics

Seventy-five percent of the sample held one or more beliefs. The study sample held a mean score of three breast cancer-related cultural beliefs out of a total 15 beliefs and 44% of the women held three or more belief versus two or less. About a third of the women fell into each age category (<50 years, 50–59 years, and 60 years or older) (Table I). Consistent with previous findings that Latina women are often diagnosed with breast cancer at a younger age, 37% of the women in the sample were under the age of 50 at the time of diagnosis. The vast majority of the women were of Mexican descent (n=105), with a small number of women reporting Puerto Rican descent (n=37) and the remaining women being categorized as other ethnicity (n=32). The other ethnicity category included women of Cuban descent, among others represented in very small numbers (Table I). In this sample, 84% reported no family history of breast cancer, 13% reported a moderate level of family history, and only 3% reported a high family history of breast cancer (Table I).

The women in this sample tended to have less than a high school education (44%), have an annual income of less than \$20,000 (38%), and the vast majority lived in census tracts of low affluence (65%). The majority of the women were born outside the United States (74%), did not speak English as a primary language (74%), and had parents who had less than a high school education and who were also born outside of the United States (Table I). Fifty-one percent of the women had a lower acculturation score (score of 0) and 49% had a higher acculturation (score of 1 or more).

Approximately 53% of the women were privately insured, and 80% of the women said they had a regular provider. Fifty-seven percent reported they had received a routine physical exam in the previous year. Only 60% of women reported receiving a mammogram in the two years prior to their diagnosis and 24% reported never receiving a mammogram (Table I). Scores for trust in regular providers ranged from 11 (greatest possible amount of trust) to 45 (least amount of trust out of a possible score of 55) (Table I). Over a third of the women (36%) reported low trust in regular providers, and almost 70% of the women had either low or moderate trust in regular providers (Table I).

**TABLE I**  
**CHARACTERISTICS OF LATINA WOMEN IN THE BREAST**  
**CANCER CARE IN CHICAGO STUDY**

		Sample (%) N=181
<b>Cultural Beliefs</b>		
Cultural Beliefs	≥1 beliefs held	135 (75)
	No beliefs held	46 (25)
	≥3 beliefs held	80 (44)
	≤2 beliefs held	101 (56)
<b>Sociodemographic Factors</b>		
Age	<50	67 (37)
	50-59	54 (30)
	≥60	60 (33)
Ethnicity	Mexican	105 (60)
	Puerto Rican	38 (22)
	Other	32 (18)
Family history of BC	None	152 (84)
	Moderate	23 (13)
	High	5 (3)
<b>Socioeconomic Factors</b>		
Education	<HS	79 (44)
	HS	39 (21)
	>HS	63 (35)
Income	≤20,000	68 (38)
	>20,000–50,000	66 (37)
	>50,000	44 (25)
Tract affluence	Low	117(65)
	High	64 (35)
Tract disadvantage	High	76 (42)
	Low	105 (58)

CHARACTERISTICS OF LATINA WOMEN IN THE BREAST  
CANCER CARE IN CHICAGO STUDY

		Sample (%) N=181
<b>Acculturation Factors</b>		
Country of origin	United States	47 (26)
	Other	134 (74)
Primary language spoken	English	43 (26)
	Other	123 (74)
Mother's country of origin	United States	26 (14)
	Other	155 (86)
Father's country of origin	United States	23 (13)
	Other	158 (87)
Mother's education	<HS	130 (79)
	HS	28 (17)
	>HS	7 (4)
Father's education	<HS	110 (76)
	HS	21 (14)
	>HS	14 (10)
Cultural isolation	High	97 (55)
	Low	84 (45)
Acculturation	Lower	92 (51)
	Higher	89 (49)
<b>Healthcare Access and Utilization Factors</b>		
Private insurance	No	85 (47)
	Yes	96 (53)
Regular Provider	No	36 (20)
	Yes	145 (80)
Last routine physical	1 year	103 (57)
	2 years	24 (13)
	>2 years	39 (22)
	never	15 (8)
Last clinical breast exam	1 year	106 (58)
	2 years	21 (12)
	>2 years	18 (10)
	never	36 (20)
Last mammogram	1 year	82 (45)
	2 years	28 (15)
	>2 years	28 (16)
	never	43 (24)
Trust in regular providers	High	52 (31)
	Moderate	54 (33)
	Low	60 (36)



B. **Association of Cultural Beliefs with Sociodemographic, Socioeconomic, Acculturation, and Access to Care Factors**

Chi-square analysis of the association of cultural beliefs with the factors listed in Table II revealed that there were several factors that were highly associated with cultural beliefs ( $p < .05$ ). Patients who were older, had less income and education, lacked private health insurance, or lived in areas of low affluence tended to hold a higher number of beliefs (3 or more versus 2 or less) (Table II). Furthermore, women who were born outside the United States, who did not speak English as a primary language, or whose parents were less educated or born outside the United States, were more likely to hold a higher number of beliefs. Family history of breast cancer and trust in providers were only marginally associated with cultural beliefs ( $p < .20$ ) and, contrary to expectation, cultural isolation and access to care factors were not associated with cultural beliefs (Table II). It is important to note that several of the factors associated with cultural beliefs are factors typically used to measure level of acculturation, such as country of origin and primary language.

**TABLE II**  
ASSOCIATION OF BELIEFS WITH SOCIODEMOGRAPHIC, SOCIOECONOMIC,  
ACCULTURATION, AND ACCESS TO CARE FACTORS IN LATINA BREAST  
CANCER PATIENTS

		Cultural Beliefs	
		≤2 beliefs (%)	≥3 beliefs (%)
<b>Sociodemographic Factors</b>			
Age	<50	69	31 <sup>c</sup>
	50-59	61	39
	≥60	37	63
Ethnicity	Mexican	53	47
	Puerto Rican	58	42
	Other	59	41
Family history of BC	None	57	43 <sup>a</sup>
	Moderate	39	61
	High	80	20
<b>Socioeconomic Factors</b>			
Education	<HS	29	71 <sup>c</sup>
	HS	69	31
	>HS	81	19
Income	≤20,000	38	62 <sup>c</sup>
	>20,000–50,000	53	47
	>50,000	86	14
Tract affluence	Low	50	50 <sup>b</sup>
	High	67	33
Tract disadvantage	High	57	43
	Low	55	45

<sup>a</sup> P<.20.

<sup>b</sup> P<.05.

<sup>c</sup> P<.01.

ASSOCIATION OF BELIEFS WITH SOCIODEMOGRAPHIC, SOCIOECONOMIC,  
ACCULTURATION, AND ACCESS TO CARE FACTORS IN LATINA BREAST  
CANCER PATIENTS

		Cultural Beliefs	
		≤2 beliefs (%)	≥3 beliefs (%)
<b>Acculturation Factors</b>			
Country of origin	United States	77	23 <sup>c</sup>
	Other	49	51
Primary language spoken	English	77	23 <sup>c</sup>
	Other	44	56
Mother's country of origin	United States	81	19 <sup>c</sup>
	Other	52	48
Father's country of origin	United States	91	9 <sup>c</sup>
	Other	51	49
Mother's education	<HS	51	49 <sup>c</sup>
	HS	79	21
	>HS	86	14
Father's education	<HS	46	54 <sup>c</sup>
	HS	76	24
	>HS	79	21
Cultural isolation	High	56	44
	Low	56	44
Acculturation	Lower	39	61 <sup>c</sup>
	Higher	73	27

<sup>a</sup> P<.20.

<sup>b</sup> P<.05.

<sup>c</sup> P<.01.

ASSOCIATION OF BELIEFS WITH SOCIODEMOGRAPHIC, SOCIOECONOMIC,  
ACCULTURATION, AND ACCESS TO CARE FACTORS IN LATINA BREAST  
CANCER PATIENTS

		Cultural Beliefs	
		≤2 beliefs (%)	≥3 beliefs (%)
Healthcare Access and Utilization Factors			
Private insurance	No	44	56 <sup>c</sup>
	Yes	67	33
Regular Provider	No	53	47
	Yes	57	43
Last routine physical	1 year	59	41
	2 years	58	42
	>2 years	46	54
	never	53	47
Last clinical breast exam	1 year	57	43
	2 years	62	38
	>2 years	50	50
	never	53	47
Last mammogram	1 year	57	43
	2 years	64	36
	>2 years	57	43
	never	47	53
Trust in regular providers	High	69	31 <sup>a</sup>
	Moderate	48	52
	Low	52	48

<sup>a</sup> P<.20.

<sup>b</sup> P<.05.

<sup>c</sup> P<.01.

C. **Prevalence of Beliefs and the Association of Individual Beliefs with Acculturation**

Table III shows a list of the 15 statements that make up the cultural beliefs scale and a breakdown of the percentage of women in the sample who believed each statement to be true. The beliefs most commonly held were: (1) Faith in God can protect you from breast cancer (48%); (2) If a breast lump is touched or pressed often, the lump will turn out to be breast cancer (30%); and (3) If breast cancer is cut open in surgery, it will grow faster (28%) (Table III). Eighty-nine percent of the women who had a lower acculturation score held one or more beliefs, compared to only 60% of women who had a higher acculturation score. The majority of the individual beliefs were highly associated with a lower acculturation score (Table III). Roughly two-thirds (65%) of women with a lower acculturation score believed that faith in God alone could protect them from breast cancer, compared to only 31% of more highly acculturated women (Table III). Similarly for most of the other beliefs, lower acculturation was associated with a greater tendency to hold each belief (Table III).

**TABLE III**  
PREVALENCE OF BELIEFS AND THE ASSOCIATION OF BELIEFS WITH ACCULTURATION

Cultural Beliefs	Percent of women who hold each belief (N=181) %	Acculturation <sup>d</sup>	
		Lower (N=92) %	Higher (N=89) %
One or more beliefs held	75	89	60 <sup>c</sup>
Faith in God can protect you from breast cancer	48	65	31 <sup>c</sup>
If a breast lump is touched or pressed often, the lump will turn out to be breast cancer	30	47	12 <sup>c</sup>
If breast cancer is cut open in surgery, it will grow faster	28	35	24 <sup>a</sup>
The more you worry about breast cancer, the more likely you will get it	26	36	16 <sup>b</sup>
If you pray enough, sometimes breast lumps will disappear by themselves, without medical treatment	26	29	24
It doesn't really matter if you get treated for breast cancer, because if you get it, breast cancer will kill you sooner or later	25	39	10 <sup>c</sup>
You only need to get a breast lump checked for cancer if it gets bigger	24	36	12 <sup>c</sup>
If you take good care of yourself, you won't get breast cancer	21	28	13 <sup>b</sup>
You only need to get a mammogram if you find a problem in your breast	19	32	7 <sup>c</sup>
You only need to get a breast lump checked for cancer if it is painful	18	32	4 <sup>c</sup>
Women with large breasts are more likely to get breast cancer than women with small breasts	18	25	10 <sup>b</sup>
If a woman has enough faith in God, she won't need treatment for breast cancer	16	24	8 <sup>b</sup>
Mammograms can cause breast cancer	13	18	8 <sup>a</sup>
If you don't have breast cancer in your family, you don't need to get mammograms	9	15	2 <sup>b</sup>
If you have a breast lump, a "natural remedy" can help to get rid of it	9	13	6 <sup>a</sup>

<sup>a</sup> P<.20.

<sup>b</sup> P<.05.

<sup>c</sup> P<.001.

<sup>d</sup> P-values represent the association between each individual belief and acculturation level.

D. **Association of Delay with Sociodemographic, Socioeconomic, Acculturation, and Access to Care Factors**

In this study, three main outcome variables were analyzed: patient delay, clinical delay, and total delay. Prolonged patient delay was defined as a delay from self-detection, or symptom awareness, to first medical presentation exceeding 30 days (sample median). Chi-square analysis revealed several factors that were at least marginally associated ( $p < .20$ ) with patient delay (Table IV). Women who were older, had less than a high school education, who lacked private insurance, or who lived in census tracts of high disadvantage were more likely to experience patient delays (Table IV). Furthermore, women who were born outside the United States, who lacked a regular provider, or who had never had a clinical breast exam were also more likely to experience patient delays (Table IV).

Prolonged clinical delay was defined as a delay from first medical presentation to first therapeutic intervention for breast cancer (surgery, radiation, chemotherapy, or hormone therapy) exceeding 60 days (sample median). Analysis revealed several factors that were at least marginally associated with clinical delay ( $p < .20$ ). Income and trust were both highly associated with clinical delay ( $p < .05$ ). Women who had a lower income ( $< \$50,000$ ) and low levels of trust in regular providers were more likely to experience clinical delays (Table IV). In addition, women who lacked private insurance, who were born outside the United States, and who did not speak English as a primary language, were more likely to experience clinical delays ( $p < .20$ ) (Table IV).

Finally, prolonged total delay was defined as a delay from initial symptom detection (self-detected or clinically detected) to first treatment exceeding 90 days (sample median). Chi-

square analysis revealed similar results for total delay. Several factors were highly associated ( $p < .05$ ) with total delay. Women who lacked private insurance, who had low levels of trust in regular providers, and who had never had a mammogram were more likely to experience a total delay (Table IV). Both primary language spoken and education were marginally associated ( $p < .20$ ) with total delay (Table IV).



**TABLE IV**

ASSOCIATION OF DELAY WITH SOCIODEMOGRAPHIC, SOCIOECONOMIC,  
ACCULTURATION, AND ACCESS TO CARE FACTORS IN LATINA BREAST CANCER  
PATIENTS

		Patient Delay (%)	Clinical Delay (%)	Total Delay (%)
<b>Sociodemographic Factors</b>				
Age	<50	38 <sup>a</sup>	44	41
	50-59	56	59	51
	≥60	58	47	40
Ethnicity	Mexican	54	50	47
	Puerto Rican	45	51	43
	Other	40	38	31
Family history of BC	None	50	47	43
	Moderate	45	70	48
	High	33	40	40
<b>Socioeconomic Factors</b>				
Education	<HS	59 <sup>a</sup>	50	47 <sup>a</sup>
	HS	44	58	55
	>HS	38	43	31
Income	≤20,000	58	56 <sup>b</sup>	46
	>20,000–50,000	44	54	49
	>50,000	43	35	33
Tract affluence	Low	50	51	46
	High	47	47	38
Tract disadvantage	High	58 <sup>a</sup>	51	46
	Low	44	48	42

<sup>a</sup> P<.20.

<sup>b</sup> P<.05.

<sup>c</sup> P<.01.

ASSOCIATION OF DELAY WITH SOCIODEMOGRAPHIC, SOCIOECONOMIC,  
ACCULTURATION, AND ACCESS TO CARE FACTORS IN LATINA BREAST CANCER  
PATIENTS

		Patient Delay (%)	Clinical Delay (%)	Total Delay (%)
<b>Acculturation Factors</b>				
Country of origin	United States	36 <sup>a</sup>	40 <sup>a</sup>	36
	Other	53	53	46
Primary language spoken	English	43	40 <sup>a</sup>	35 <sup>a</sup>
	Other	52	54	47
Mother's country of origin	United States	31 <sup>a</sup>	54	42
	Other	52	49	44
Father's country of origin	United States	18 <sup>b</sup>	57	39
	Other	53	48	44
Mother's education	<HS	54 <sup>b</sup>	47	43
	HS	43	61	46
	>HS	0	43	29
Father's education	<HS	53	55 <sup>a</sup>	52 <sup>b</sup>
	HS	44	47	37
	>HS	33	36	21
Cultural isolation	High	49	49	45
	Low	49	49	42
Acculturation	Lower	63 <sup>c</sup>	60 <sup>c</sup>	53 <sup>b</sup>
	Higher	33	39	34

<sup>a</sup> P<.20.

<sup>b</sup> P<.05.

<sup>c</sup> P<.01.

ASSOCIATION OF DELAY WITH SOCIODEMOGRAPHIC, SOCIOECONOMIC,  
ACCULTURATION, AND ACCESS TO CARE FACTORS IN LATINA BREAST CANCER  
PATIENTS

		Patient Delay (%)	Clinical Delay (%)	Total Delay (%)
<b>Healthcare Access and Utilization Factors</b>				
Private insurance	No	57 <sup>a</sup>	56 <sup>a</sup>	52 <sup>b</sup>
	Yes	41	44	37
Regular Provider	No	65 <sup>a</sup>	53	50
	Yes	44	49	42
Last routine physical	1 year	47	49	44
	2 years	45	61	43
	>2 years	46	50	47
	never	83	29	29
Last clinical breast exam	1 year	44 <sup>a</sup>	51	45 <sup>b</sup>
	2 years	36	45	30
	>2 years	44	50	22
	never	67	47	58
Last mammogram	1 year	48	55	47
	2 years	42	54	39
	>2 years	57	44	44
	never	50	39	39
Trust in regular providers	High	43	41 <sup>b</sup>	31 <sup>c</sup>
	Moderate	52	40	38
	Low	44	63	56

<sup>a</sup> P<.20.

<sup>b</sup> P<.05.

<sup>c</sup> P<.01.

E. **Association of Cultural Beliefs with Delay**

The results describing the overall association of cultural beliefs with healthcare delay are displayed in Table V. Approximately 54% (n=98) of the women in the sample had a self-detected, symptomatic breast cancer. The mean patient delay in the sample was 76 days with a median patient delay of 30 days. For the total sample, the mean clinical delay was 89 days with a median delay of 59 days, and finally the mean total delay in the sample was 113 days with a median of 84 days. Both clinical delay (57% versus 43%,  $p=.07$ ) and total delay (59% versus 32%,  $p=.0005$ ) were more common for women holding three or more beliefs versus those holding two or less beliefs (Table V). Cultural beliefs did not appear to be significantly associated with prolonged patient delay (time from symptom self-awareness to first clinical visit exceeding the medial delay of 30 days) at  $p<.05$ ; however, there was an eleven percentage point difference in patient delay for women with three or more beliefs versus two or less (Table V). The association between cultural beliefs and patient delay hints at a similar trend as was observed for clinical delay and total delay (Table V).

**TABLE V**  
ASSOCIATION OF CULTURAL BELIEFS WITH DELAY  
IN LATINA BREAST CANCER PATIENTS

	N	% with a delay	X <sup>2</sup> p value
<b>Patient Delay</b>	98		
3 or more beliefs	44	55	0.3198
≤2 beliefs	54	44	
<b>Clinical Delay</b>	172		
3 or more beliefs	75	57	0.0679
≤2 beliefs	97	43	
<b>Total Delay</b>	172		
3 or more beliefs	75	59	0.0005
≤2 beliefs	97	32	

F. **Association of Individual Beliefs with Patient, Clinical, and Total Delay**

Table VI describes the association of each individual belief with the three types of delay. In Table V, it appeared that overall cultural beliefs were not significantly associated with patient delay; however, the results in Table VI indicate that several of the individual beliefs are associated with prolonged patient delay and clinical delay at  $p < .20$ . Three beliefs were associated with all three types of delay at  $p < .20$ : “Faith in God can protect you from breast cancer,” “You only need to get a breast lump checked for cancer if it gets bigger,” and “You only need to get a breast lump checked for cancer if it is painful.” Approximately 55% of women who experienced a total delay believed that faith in God could protect them from breast cancer, compared to 43% of women who did not experience a delay. In general, among women who did not experience a delay, a smaller percentage of women held each belief compared to women who did experience a delay.

**TABLE VI**  
ASSOCIATION OF INDIVIDUAL BELIEFS WITH PATIENT, CLINICAL, AND TOTAL DELAY

Cultural Beliefs	Patient Delay (N=98)		Clinical Delay (N=172)		Total Delay (N=172)	
	≤1 month	>1 month	≤2 months	>2 months	≤3 months	>3 months
	%	%	%	%	%	%
One or more beliefs held	74	83	71	76	69	80 <sup>a</sup>
Faith in God can protect you from breast cancer	43	58 <sup>a</sup>	42	55 <sup>a</sup>	43	55 <sup>a</sup>
If a breast lump is touched or pressed often, the lump will turn out to be breast cancer	24	27	24	34 <sup>a</sup>	25	35 <sup>a</sup>
If breast cancer is cut open in surgery, it will grow faster	26	30	25	34	24	37 <sup>a</sup>
The more you worry about breast cancer, the more likely you will get it	24	31	22	29	19	35 <sup>b</sup>
If you pray enough, sometimes breast lumps will disappear by themselves, without medical treatment	38	15 <sup>c</sup>	30	24	30	23
It doesn't really matter if you get treated for breast cancer, because if you get it, breast cancer will kill you sooner or later	24	25	19	28 <sup>a</sup>	19	31 <sup>a</sup>
You only need to get a breast lump checked for cancer if it gets bigger	16	27 <sup>a</sup>	18	31 <sup>a</sup>	17	33 <sup>b</sup>
If you take good care of yourself, you won't get breast cancer	14	25 <sup>a</sup>	17	22	14	27 <sup>b</sup>
You only need to get a mammogram if you find a problem in your breast	14	19	15	24 <sup>a</sup>	14	25 <sup>a</sup>
You only need to get a breast lump checked for cancer if it is painful	12	23 <sup>a</sup>	14	22 <sup>a</sup>	11	27 <sup>b</sup>
Women with large breasts are more likely to get breast cancer than women with small breasts	12	21	17	18	14	21
If a woman has enough faith in God, she won't need treatment for breast cancer	12	15	16	15	16	16
Mammograms can cause breast cancer	12	12	13	14	12	15
If you don't have breast cancer in your family, you don't need to get mammograms	6	6	8	7	6	9
If you have a breast lump, a "natural remedy" can help to get rid of it	8	6	8	10	7	11

<sup>a</sup> P<.20.

<sup>b</sup> P<.05.

<sup>c</sup> P<.001.

#### G. **Confounding Assessment Results**

In general, there did not appear to be much confounding of the relationship between cultural beliefs and patient delay, clinical delay or total delay (Table VII). A few variables that somewhat consistently appeared to be confounders were: acculturation, trust in providers, income, education, and insurance.

#### H. **Results of Automated Model Selection Procedures**

Table VIII displays the results of the automated model selection procedures that were used in preliminary model building. Both a forward and backward selection procedure was used with a liberal alpha of 0.25 to create predictive logistic regression models of prolonged patient delay, clinical delay, and total delay. Other automated procedures were tested using alpha values of 0.05, 0.10, and 0.20; however, an alpha value of 0.25 was selected as the most appropriate due to small sample size. In general, the results were not highly consistent; however, acculturation, trust in providers, income, and education were selected into several models. The same analysis was conducted with cultural beliefs as a continuous variable ranging from a score of 0 to 15 and produced similar results.

**TABLE VII**  
CONFOUNDING ASSESSMENT RESULTS

	Covariate	N <sup>a</sup>	Crude OR	N <sup>b</sup>	Unadjusted OR	Adjusted OR <sup>c</sup>
<b>Patient Delay</b>	Acculturation	98	1.500	98	1.500	1.154*
	Cultural isolation			98	1.500	1.536
	Trust in providers			87	1.781*	1.716*
	Family history			98	1.500	1.510
	Age			98	1.500	1.397
	Income			98	1.500	1.344*
	Education			98	1.500	1.344*
	Insurance			98	1.500	1.344*
	Regular physician			98	1.500	1.344
	Last routine physical			98	1.500	1.344
	Last clinical breast exam			98	1.500	1.344
	Last mammogram			98	1.500	1.344
	Total mammograms in past 5 years			97	1.565	1.344
<b>Clinical Delay</b>	Acculturation	172	1.760	172	1.760	1.795
	Cultural isolation			172	1.760	1.762
	Trust in providers			158	1.745	1.584*
	Family history			171	1.728	1.710
	Age			172	1.760	1.685
	Income			169	1.827	1.517
	Education			172	1.760	1.824
	Insurance			172	1.760	1.628
	Regular physician			172	1.760	1.754
	Last routine physical			172	1.760	1.822
	Last clinical breast exam			172	1.760	1.772
	Last mammogram			172	1.760	1.839
	Total mammograms in past 5 years			172	1.760	1.793
<b>Total Delay</b>	Acculturation	172	3.022	172	3.022	3.017
	Cultural isolation			172	3.022	3.042
	Trust in providers			158	3.167	2.907
	Family history			171	2.976	2.974
	Age			172	3.022	3.241
	Income			169	3.177	2.957
	Education			172	3.022	3.061
	Insurance			172	3.022	2.774*
	Regular physician			172	3.022	3.010
	Last routine physical			172	3.022	3.123
	Last clinical breast exam			172	3.022	3.005
	Last mammogram			172	3.022	3.097
	Total mammograms in past 5 years			172	3.022	3.034

<sup>a</sup> Total number of observations.

<sup>b</sup> Number of observations with data on a specific covariate.

<sup>c</sup> Association between cultural beliefs and delay adjusted for the indicated covariate.

\* Adjusted or Unadjusted OR differed by more than 10% from Crude OR.



**TABLE VIII**  
RESULTS OF AUTOMATED MODEL SELECTION PROCEDURES

Covariate	Forward (alpha 0.25) <sup>a</sup>			Backward (alpha 0.25) <sup>a</sup>		
	Patient Delay	Clinical Delay	Total Delay	Patient Delay	Clinical Delay	Total Delay
Cultural beliefs			X		X	X
Acculturation	X			X	X	
Cultural isolation	X			X		
Trust in providers		X	X		X	X
Family history		X			X	
Age						
Income		X			X	
Education	X			X		
Insurance						
Regular physician	X					
Last routine physical	X			X		
Last clinical breast exam	X			X		
Last mammogram				X		
Total mammograms in past 5 years		X		X	X	

<sup>a</sup> X indicates that the covariate was selected for inclusion in the model.

#### I. **Final Modeling Results for the Association Between Cultural Beliefs and Delay**

Table IX displays the final logistic regression modeling results. Before adjusting for any confounding factors, holding three or more beliefs was associated with 3.02 times the odds of experiencing a total delay from symptom detection (self-detected or clinically detected) to initiation of treatment (95% CI: 1.61–5.66). After adjusting for age, education, income, and acculturation, holding three or more beliefs was associated with 3.35 times the odds of experiencing a total delay from symptom detection to initiation of treatment (95% CI: 1.55–7.22; p-value=.0021; N=169) (Table IX). Prior to selecting the final model, an alternative model which adjusted for age, education, income, acculturation, and trust was initially considered. In this initial model, holding three or more beliefs was associated with 3.13 times the odds of

experiencing a total delay from symptom detection to initiation of treatment (95% CI: 1.389–7.043; p-value=0.0059; N=156). The decision was made to select the more parsimonious model as the final model due to the results not differing significantly between the two models and the loss in sample size of 13 subjects if the alternative model was selected.

**TABLE IX**  
FINAL MODELING RESULTS FOR ASSOCIATION BETWEEN  
CULTURAL BELIEFS AND DELAY IN LATINA BREAST CANCER  
PATIENTS

	N	Crude OR	Adjusted OR <sup>a</sup>	P-value
Patient delay	98	1.50 (0.67–3.34)	0.89 (0.34–2.28)	0.8007
Clinical delay	169	1.76 (0.96–3.23)	1.74 (0.83–3.65)	0.1449
Total delay	169	3.02 (1.61–5.66)	3.35 (1.55–7.22)	0.0021

<sup>a</sup> Adjusted for age, education, income, and acculturation.

Based on the results, holding three or more cultural beliefs was not associated with patient delay, both prior to adjusting for covariates or after adjustment (OR=1.50 [0.67–3.34]; OR=.89 [0.34–2.28], p-value=.8007, respectively) (Table IX). Similarly, holding three or more cultural beliefs was not significantly associated with a woman experiencing a prolonged clinical delay either before or after adjusting for covariates (OR= 1.76 [0.96–3.23]; OR=1.74 [0.83–3.65], p-value=.1449, respectively) (Table IX). Though there did not appear to be a statistically

significant association, it is fair to say that the results hint at a potential association between holding three or more cultural beliefs and increased odds of experiencing a clinical delay.

#### **IV. DISCUSSION**

This study aimed to: (1) describe the characteristics of an urban Latina breast cancer patient population; (2) explore the breast cancer-related beliefs held by this population and the factors associated with Latina women holding a greater number of breast cancer-related cultural beliefs; and (3) analyze the relationship between a woman holding a higher number of cultural beliefs and delaying in seeking medical care or receiving treatment. It was originally hypothesized that women who held a higher number of cultural beliefs would have greater odds of both delaying in seeking care for a breast symptom (patient delay) and in receiving treatment for breast cancer. There does not appear to be a significant association between cultural beliefs and patient or clinical delay; however, women holding three or more beliefs have significantly greater odds of experiencing a total delay than women who hold two or less beliefs. The association between cultural beliefs and total delay remained highly significant even after adjustment for covariates that have been linked to total delay in the literature. Rauscher et al. (2010), which utilized the same data set as this study, found a significant association between holding one or more cultural beliefs related to breast lumps and prolonged patient delay exceeding 90 days; however, that study sample was much larger and included African American, White, and Latina women.

The results of this study demonstrated that the 15 cultural beliefs analyzed were very prevalent among the sample; approximately 75% of the sample held one or more beliefs and 44% held three or more beliefs. There are various potential explanations for the high prevalence of cultural beliefs in the sample. Overall, the Latina women in the sample demonstrated decreased trust in their regular providers. Almost 80% of the women reported having a regular provider; however, 70% of the sample had either low or moderate trust in their regular providers.

This could potentially be problematic because the study by Kaiser et al. (2010) demonstrated that trust in regular providers translates into trust in diagnosing doctors and oncologists. If a woman does not trust her physician she may be less likely to see them on a regular basis for care and less likely to follow their advice; furthermore, a lack of trust may hinder open communication between the doctor and the patient. This might explain why such a high proportion of the sample continued to hold cultural beliefs or misconceptions about breast cancer even after interacting with oncologists during their cancer treatment. An additional factor that may have contributed to the high prevalence of cultural beliefs in the sample is the relatively low level of family history of breast cancer among the women. It is likely that prior to their diagnosis, the women in the sample had little to no exposure to breast cancer, potentially leading to misconceptions about the causes and symptoms of breast cancer.

The lack of family history in the sample may partially explain why only 60% of the women had received a mammogram in the two years prior to diagnosis and 24% had never received a mammogram. There were a high proportion of women in the sample who were diagnosed under the age of 50 (37%). It is possible that the younger women did not qualify for routine mammography prior to diagnosis or that physicians had not recommended mammography screening since the women in the sample tended to be low risk and had little to no family history. The alternative is that physicians were recommending mammography screening but due to their low family history and lack of exposure to the disease the women were underutilizing available screening services.

Based on the literature and previous findings in Rauscher et al. (2010), it seems plausible that the lack of association between cultural beliefs and patient delay or clinical delay is primarily an issue of sample size and power. It seems unlikely for there to be such a strong

association between cultural beliefs and total delay but no significant association with either patient delay or clinical delay. If patient delay and total delay had been significantly associated with cultural beliefs and clinical delay showed no significant association, then it might indicate that patient delay and not clinical delay was driving the association between cultural beliefs and total delay. The results warrant further investigation, ideally in a larger sample size that allows for enough power to detect a significant difference in patient and clinical delay between women with a lower and higher level of beliefs.

A. **Limitations of this Study**

There were several limitations in this study that may explain the unexpected results. One of the greatest limitations was the small sample size. There were only 181 total women in the sample and 98 women who had a self-detected, symptomatic breast cancer. Despite the small sample size, the association of cultural beliefs with total delay was highly significant. Another significant limitation was the issue of patient self-reported data. The main outcomes, patient delay, clinical delay, and total delay, were self-reported rather than verified via an electronic medical record or claims data and rounded to the nearest month in days. It is possible that patients may not accurately remember the amount of time that passed between self-detection of a symptom and the first visit to their doctor. This might partially explain the diminished association between cultural beliefs and presentation delay; however, O'Mahony et al. (2011) found that women tend to be very adept at remembering the date when they found a symptom and could often link the discovery to a specific day or event. An additional concern is that patients may have underreported the amount of time they delayed in seeing a physician for a breast symptom due to social pressure and self-report bias. Due to these concerns the decision

was made not to use mean patient, clinical, and total delay in days as the primary study outcomes.

There were additional limitations with the manner in which patient delay was defined. Prolonged patient delay was defined as a delay in a woman seeking care for a symptom that exceeded 30 days. This was done due to small sample size ( $n=95$ ); however, the majority of the literature on patient delay defines prolonged patient delay as a delay that exceeds 90 days. Additionally, patient delay may have captured two different issues: the amount of time a woman delays in seeking an appointment for a breast symptom and the amount of time a woman must wait for an appointment once it is requested. These limitations may partially explain the lack of a significant association between cultural beliefs and patient delay. Despite these limitations, women with three or more beliefs still had an eleven percentage point difference in patient delay compared to women with two or less beliefs (55% versus 44%,  $p=.3198$ ) (Table V).

An additional limitation of the study is the time at which cultural beliefs were measured. Beliefs were measured after women had already been diagnosed with breast cancer and initiated treatment, events which could alter a woman's beliefs and knowledge related to breast cancer (Gullatte et al., 2010). It is possible that women may have been exposed to more information about breast cancer during treatment, so that the pre-breast cancer level of cultural beliefs may have in fact been higher. Conversely, it is possible that the stress of the diagnostic and treatment processes increased certain beliefs, especially those related to faith and religiosity. Previous studies have found that faith based beliefs can increase during these times (Feher and Maly, 1999). Due to this limitation, it is possible that the measured association between cultural beliefs and delay was attenuated or inflated from the true association. Finally, at the time the study was designed, a more complex and validated acculturation measure was not included in the survey.

Due to this, it was necessary to create an acculturation scale based on available information in the data set. The acculturation scale that was created did provide significant results and in a future study it would be useful to validate this scale against other valid acculturation scales.

Finally, there is a potential issue of generalizability of this study to other studies on Latina women due to the sample being primarily Mexican, foreign born, and highly unacculturated. The number of women in the sample who were of non-Mexican Latino origin was very small and did not allow for ethnic subgroup analysis. Several studies have found that breast cancer beliefs, use of screening services, and breast cancer outcomes (Ooi et al., 2011) vary by Latino subgroup. Though Mexicans often experience poorer breast cancer outcomes compared to other Latino subgroups, it is important for studies focusing on Latinos to differentiate between ethnic subgroups.

#### **B. Strengths of this Study**

The majority of studies on cultural beliefs, especially in Latina women, are qualitative in nature (Chavez et al., 2001; Goldman and Risica, 2004; Koval et al., 2006; Luquis and Villanueva Cruz, 2006; Shelton et al., 2011). While these types of studies can be informative in developing scales to measure beliefs and preliminary hypothesis development, they do not allow researchers to quantify the types of beliefs and number of beliefs that are held by different groups. The cultural beliefs scale that is utilized in this study allows measurement of both the type and number of beliefs that are held. Furthermore, it allows for easier comparison between the cultural beliefs held by different racial/ethnic or socioeconomic groups.



Despite the lack of a more complex, validated acculturation scale in the data set, the acculturation scale that was developed for the purposes of this study proved to be very rich. Most acculturation scales measure a person's level of acculturation through language preference and length of residency in the United States (Siatkowski, 2007; O'Malley et al., 1999; Abraido-Lanza et al., 2005). While these methods can be useful and simple to use, they neglect other important factors that can influence acculturation, such as education, family dynamics, country of origin, age at immigration, parental education, and parental country of origin (Siatkowski, 2007). The acculturation scale used in this study aimed to capture this more complex and rich picture of acculturation by including parental factors as well as the subjects' language and country of origin. Finally, several studies on delay either focus entirely on total delay or measure delay from the time of symptom self-discovery by the patient to diagnosis or treatment. This study is unique in its ability to analyze both patient delay and clinical delay separately, and assess the influence of cultural beliefs, a patient level factor, on both patient delay and clinical delay.

### C. **Conclusion**

Cultural beliefs may predispose certain Latina women who are less acculturated and of lower SES to prolong seeking care for breast symptoms and may influence delays in receiving treatment for breast cancer. This research has various implications for identifying Latina women who may be at risk of delaying to seek care for a breast symptom or who may experience delays in the diagnosis and treatment process. Future studies need to test the cultural beliefs scale in a larger sample of healthy Latina women of diverse ethnic subgroups who have not had breast cancer in order to measure the true prevalence of these beliefs in the Latina population. The focus of interventions needs to be not only on improving access to care and screening services

for Latina women, but on targeting these potentially detrimental beliefs through proactive engagement and education. Targeting these beliefs in disadvantaged Latino communities through culturally sensitive educational interventions may be part of an effective strategy to reduce delays in breast cancer care and ultimately improve outcomes and save lives.

## APPENDIX

### BREAST CANCER BELIEFS ©

**Carol Estwing Ferrans et al., 2005**  
**UIC Center for Population Health and Health Disparities**  
**University of Illinois at Chicago**

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People have different opinions about breast cancer symptoms and its treatment. We are interested in your opinions about the following statements. Please indicate if you think these statements are TRUE or FALSE.

1. If a breast lump is not painful, it is not cancer.

True..... 1

False..... 2

2. If a breast lump does not get bigger, it is not cancer.

True..... 1

False..... 2

3. If a breast lump is touched/pressed often, the lump will turn out to be breast cancer.

True..... 1

False..... 2

4. Women with large breasts are more likely to get breast cancer than women with small breasts.

True..... 1

False..... 2

5. The more you worry about breast cancer, the more likely you will get it.

True..... 1

False..... 2

## APPENDIX (continued)

6. If you take good care of yourself, you won't get breast cancer.

True..... 1

False..... 2

7. Faith in God can protect you from breast cancer.

True..... 1

False..... 2

8. You only need to get a mammogram if you find a problem in your breast.

True..... 1

False..... 2

9. Mammograms can cause breast cancer.

True..... 1

False..... 2

10. If you pray enough, sometimes breast lumps will disappear.

True..... 1

False..... 2

11. If breast cancer is cut open in surgery, it will grow faster.

True..... 1

False..... 2

12. If you don't have breast cancer in your family, you don't need to get mammograms.

True..... 1

False..... 2

## APPENDIX (continued)

13. If you have a breast lump, a “natural” remedy can help to get rid of it.

True..... 1

False..... 2

14. If a woman has enough faith in God, she won’t need treatment for breast cancer.

True..... 1

False..... 2

15. If a woman is poor, she won’t get cured from cancer, because she won’t get the best treatment.

True..... 1

False..... 2

16. If breast cancer is treated correctly, it can be cured.

True..... 1

False..... 2

17. It doesn’t really matter if you get treated for breast cancer, because if you get cancer, it will kill you sooner or later.

True..... 1

False..... 2

## CITED LITERATURE

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