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Garcia-Jimenez, Maria de Lourdes

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Culture and Self-rated Health Among Latina Breast Cancer Survivors: The Role of  
Cancer Self-efficacy and Spiritual Well-being

By

Maria de Lourdes Garcia-Jimenez

A thesis submitted in partial satisfaction of the  
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Committee in charge:

Karen Sokal-Gutiérrez, M.D., M.P.H., Co-chair  
Anna Napolés, M.P.H., Ph.D., Co-chair  
Maureen Lahiff, Ph.D.  
Ndola Prata, M.D., M.Sc.

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Cancer Self-efficacy and Spiritual Well-being

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by Maria de Lourdes Garcia-Jimenez

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### Paper 2: Culture and Self-rated Health Among Latina Breast Cancer Survivors: The Role of Cancer Self-efficacy and Spiritual Well-being

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## Paper 1: Review of Literature

### INTRODUCTION

Health disparities research in the United States has previously focused on differential access to health care and socioeconomic differences as explanatory factors (Prentice, Pebley et al. 2005; Bzostek, Goldman et al. 2007; Harper and Lynch 2007; Sabanayagam and Shankar 2010). However, research on the associations of race, culture, sociocultural factors, and health status in the U.S. is increasing (Morales and Lara 2002; Franzini and Fernandez-Esquer 2004; Bzostek, Goldman et al. 2007; Gallo, Penedo et al. 2009). Additionally, acculturation has been linked to differences in health outcomes such that foreign-born immigrants tend to be healthier than their U.S.-born counterparts (Singh and Siahpush 2002; Singh and Miller 2004; Gallo, Penedo et al. 2009). These health benefits have also been shown to dissipate with longer time living in the U.S. Sociocultural and socioeconomic forces behind these differences have been largely unexplored, despite their relevance to addressing ethnic health disparities, such as those seen in breast cancer.

Although the age-adjusted incidence of breast cancer is lower among Latinas (90.2/100,000) than non-Latino White (henceforth “NLW”) women (126.9/100,000), significant health disparities exist in the diagnosis, treatment, and mortality of breast cancer for Latinas compared to NLW women (Buki, Garcés et al. 2008; Maly, Stein et al. 2008). Breast cancer staging utilizes the terms “localized,” to describe an early, less severe form of cancer, and “regional,” to describe a more advanced, severe form. According to the 2009 Surveillance, Epidemiology, and End Results (SEER) Program report, 55% of breast cancers among Latinas were diagnosed at the localized stage, compared to 63% of the cases among NLW women. Simultaneously, 38% of breast cancers among Latinas were diagnosed at the regional stage, while only 30% of breast cancers among NLW women were diagnosed at this stage (Siegel, Cokkinides et al. 2009). In 2011 the 5-year survival rate for NLW women with breast cancer was 88.8%, slightly improved from 88.5% in 2009, while for Latinas with breast cancer it was 83.8%, down from 85.8% in 2009 (DeSantis, Siegel et al. 2011). This represents a widening in the breast cancer survival gap across ethnic background. Beyond these disparities, there is evidence that Latinas are at greater risk than their NLW counterparts of psychosocial distress after a breast cancer diagnosis (Morales and Lara 2002; Vega, Rodriguez et al. 2009; Luckett, Goldstein et al. 2011). While this increased psychosocial distress may result from their already vulnerable status as ethnic minorities, and their low socioeconomic profiles, sociocultural and intrapersonal risk and resilience factors influencing psychosocial disparities in breast cancer survivorship need to be explored. Research on the influence of these factors on general health status for Latina breast cancer survivors is also necessary.

Utilizing a sociocultural framework to conceptualize the existing disparities in the survivorship experience of Latina breast cancer survivors compared to NLW breast cancer survivors I hope to elucidate modifiable intrapersonal and sociocultural risk and resilience factors influencing these disparities. I also hope to identify the role of these factors, and any differences in health status across Latina breast cancer survivors, within the context of acculturation. Understanding the role of intrapersonal factors and sociocultural factors, as well as the influence of acculturation, in the breast cancer survivorship experience of Latinas is crucial to the design of targeted, culturally appropriate interventions for this already marginalized population.

In this review of literature I will present evidence of: 1) ethnic health disparities and acculturative stressors experienced by the Latino population in the U.S., 2) current disparities in breast cancer and breast cancer survivorship for Latinas compared to NLW women, and 3) sociocultural factors previously shown to influence breast cancer survivorship among Latinas, which may operate as resilience factors and might serve as targets in interventions for addressing ethnic disparities in breast cancer survivorship. I will also 4) introduce self-rated health as an important measure of overall health status in breast cancer survivors, and 5) its susceptibility to the influence of acculturation and sociocultural factors. Lastly, I will 6) introduce the construct of cancer self-efficacy, its role in coping and adjustment to breast cancer, and its known association with sociocultural factors and self-rated health. In presenting this evidence I hope to also highlight the need for exploring the relationship between acculturation and self-rated health in Latina breast cancer survivors, as well as the potential influence of specific sociocultural factors and cancer self-efficacy on this relationship.

## **LATINOS IN THE UNITED STATES**

The Latino population in the U.S. is one of the most complex and rapidly growing. Overall, they are the youngest and largest minority population in the U.S., they are overwhelmingly represented in lower socioeconomic strata, and they have been known to experience different health outcomes based on country of origin (Ennis, Rios-Vargas et al. 2011; Gallo, Penedo et al. 2009).

### ***The Fastest Growing Minority Group***

Latinos are the largest and fastest-growing minority group in the United States, and they accounted for more than half of the growth in the U.S. between 2000 and 2010 (U.S. Census 2002; Ennis, Rios-Vargas et al. 2011). Latinos are also the youngest ethnic minority group in the U.S. with a median age of 27.6 compared to 36.6 for the U.S. population overall (Ennis, Rios-Vargas et al. 2011). Furthermore, in 2009, 27% of Latino adults who were U.S. citizens were under the age of 30 as compared to 22% of the total adult U.S. population (Morales and Lara 2002; Livingston 2009). However, despite their young age and continued growth, Latinos in the U.S. face challenging socioeconomic and health circumstances.

### ***High-risk Socioeconomic Profile***

Latinos in the U.S. experience greater poverty, lower incomes, and less access to health care compared to NLWs (Franzini and Fernandez-Esquer 2004). The percentage of Latinos below the poverty level in 2000 was 27% as compared to 19% for the U.S. general population. The overrepresentation of Latinos in low socioeconomic strata is associated with higher unemployment rates and lack of health care coverage (Livingston 2009; Ennis, Rios-Vargas et al. 2011). Importantly in 2009, 35.9% of Latinos under the age of 65 lacked health insurance, compared with 22.6% of African Americans and 17% of NLWs (Roberts and Rhoades 2010). Foreign-born Latinos are also the largest foreign-born ethnic group in the U.S. (Gallo, Penedo et al. 2009). Unlike U.S. born Latinos, they face immigration related stressors that compound the challenges associated with their low socioeconomic status (SES) profile (Gallo, Penedo et al. 2009).



### ***Health Status and Acculturation***

Inconsistent with their high-risk SES profile, however, studies suggest that across some dimensions, foreign-born Latinos in the United States have better health indicators than their U.S.-born counterparts (Gallo, Penedo et al. 2009). For example, data from the National Longitudinal Mortality Study revealed that after controlling for SES and level of education, foreign-born Latino men had a 46% lower mortality risk compared to U.S.-born NLW men, while U.S. born Latino men only had a 29% lower risk. Compared to U.S.-born NLW women, foreign-born Latino women had a 45% lower risk of mortality, while U.S.-born Latino women only had a 21% lower risk (Singh and Siahpush 2002). Foreign-born Latinos were also 56% less likely to report a chronic health condition than U.S.-born NLWs, while U.S.-born Latinos were only 20% less likely (Singh and Siahpush 2002; Singh and Miller 2004). Studies like these highlight the heterogeneity of the Latino health profile in the U.S. across birthplace.

Although the reasons for the differences in health outcomes between foreign-born and U.S.-born Latinos are not entirely clear, there are multiple theories. The healthy migrant theory, for example, has posited that healthier persons are more likely to emigrate (Morales and Lara 2002; Gallo, Penedo et al. 2009). A second theory is that older or dying Latinos return to their country of origin to die and thus inflate life expectancy estimates in the U.S. (Morales and Lara 2002). Lastly, the acculturation hypothesis proposes that traditional Latino cultural components result in health-related behaviors that are protective (Gallo, Penedo et al. 2009; Lara, Gamboa et al. 2005). As these traditional cultural orientations are lost or changed to U.S. cultural orientations some protective behaviors are lost (Gallo, Penedo et al. 2009; Lara, Gamboa et al. 2005). Unfortunately, although foreign-born Latinos experience better health outcomes, certain health conditions are still more common among the overall Latino population in the U.S. compared to NLWs.

### **ETHNIC DISPARITIES IN INCIDENCE OF DISEASE**

Despite the better health in certain aspects for foreign-born Latinos compared to U.S.-born Latinos, Latinos overall have a greater incidence of certain chronic diseases such as obesity, diabetes mellitus, and certain types of cancer (Morales and Lara 2002; Marotta and Garcia 2003; Vega, Rodriguez et al. 2009). In 2006, for example, the incidence of diabetes mellitus for Latinos was 33.3/100,000 persons as compared to 24.6/100,000 persons for the general population in the United States. With respect to cancer, the incidence of liver, stomach, and cervical cancers is greater among Latinos than NLWs in the U.S. (Vega, Rodriguez et al. 2009). Though the incidence of breast cancer is not greater among Latinas than NLW women, Latinas in the U.S. are considerably impacted by this disease.

### **EPIDEMIOLOGY OF BREAST CANCER IN THE UNITED STATES**

Excluding skin cancer, breast cancer is the most commonly occurring cancer among women in the U.S. (Spencer, Lehman et al. 1999). Although breast cancer awareness and breast cancer screening practices have improved over time, the risk of breast cancer for women in the U.S. increased to 1 in 8 in 2010 from 1 in 11 in the 1970's (DeSantis, Center et al. 2009). In fact, in 2009 breast cancer accounted for 1 in 4 cancer diagnoses among women in the U.S. (Spencer, Lehman et al. 1999; Siegel, Ward et al. 2011). Though the increased risk of breast cancer among U.S. women is countered by the high survivability of this particular disease (5-year relative survival is 99% for localized breast cancer and 84% for regional breast cancer), significant racial

disparities exist in the disease experience and survivorship experience of breast cancer, particularly for Latinas (DeSantis, Siegel et al. 2011).

### ***Breast Cancer Among Latinas***

While only lung cancer causes more deaths among NLW women in the U.S. than breast cancer, among Latino women in the U.S. breast cancer is the most commonly diagnosed cancer and the leading cause of cancer death (Siegel, Cokkinides et al. 2009). Compared to NLW women Latinas are diagnosed at later stages of disease, are more likely to be diagnosed with larger tumors, are less likely to receive breast conserving surgery, and are 20% more likely to die of breast cancer than NLW women diagnosed at a similar age and stage (Singh and Siahpush 2002; Siegel, Cokkinides et al. 2009). Currently, breast cancer constitutes 29.2% of all cancers among Latina women, compared to 6.8% for lung cancer and 6.2% for cervical cancer (Siegel, Cokkinides et al. 2009). Unfortunately the age-adjusted incidence of breast cancer for Latinas has remained the same since 2000, despite having declined for NLW women and African-American women (Carozza and Howe 2006; Siegel, Cokkinides et al. 2009; Liu, Zhang et al. 2012). These breast cancer specific disparities for Latinas are superimposed on the unique challenges experienced by the overall Latino population in the U.S., a combination likely to impact the survivorship experience of Latinas with breast cancer.

### ***Breast Cancer Survivorship***

Increased life expectancy and changes in reproductive patterns have augmented lifetime risk of breast cancer for women in the U.S., however, continued advances in early detection, preventative screening campaigns, and effective treatment have made breast cancer a chronic illness for most women diagnosed (Aziz and Rowland 2002). Prevalence estimates for 1990–2008 indicate that more than 101,000 Latina breast cancer survivors lived in the United States in January 2008, and currently it is estimated that 1 in every 11 Latinas will develop invasive breast cancer over her lifetime (Siegel, Cokkinides et al. 2009; Howlader, Noone et al. 2011). This in combination with the growing Latino population in the U.S., estimated to make up 25% of the U.S. population by 2050, indicates that the number of Latina breast cancer survivors will continue to grow (U.S.Census 2002). Despite the growing number of Latina breast cancer survivors, our knowledge of their survivorship experience is limited.

## **ETHNIC DISPARITIES IN SURVIVORSHIP & COPING WITH BREAST CANCER**

The limited research exploring breast cancer survivorship in women of different ethnic backgrounds has shown greater psychosocial morbidity and poorer quality of life among Latinas living with breast cancer compared to NLW women (Spencer, Lehman et al. 1999; Napoles-Springer, Ortiz et al. 2007; Luckett, Goldstein et al. 2011; Khan, Amatya et al. 2012). This research indicates breast cancer survivorship may be disproportionately more stressful and anxiety inducing for Latinas as compared to NLW women because of their ethnic minority status and low socioeconomic profiles.

Studies among multiethnic breast cancer survivors, however, have indicated that ethnic differences in the psychosocial morbidity of breast cancer persist after controlling for SES (Kagawa-Singer 1995; Spencer, Lehman et al. 1999). In a tri-ethnic (African American, Caucasian, and Latino) sample of 223 breast cancer survivors, which controlled for employment status and education level, Latina breast cancer survivors had significantly higher mean scores

for concerns about life issues ( $z$  score=0.77,  $p<0.001$ ) than NLW women ( $z$  scores=-0.10,  $p<0.001$ ) or African American women ( $z$  scores=-0.58,  $p<0.001$ ). Life issues were defined as problems doing housework, financial problems, and disruption of daily routine and family activities. Similarly, Latinas also reported significantly greater pain issues ( $p<0.001$ ). Among all women in the study, life and pain issues predicted emotional disruption (greater levels of anxiety, anger, or depression) and social disruption (changes in engagement with social and recreational activities) (Spencer, Lehman et al. 1999).

Ethnic differences in coping strategies for breast cancer survivors have also been found after accounting for differences in SES. A cross-ethnic study of 131 breast cancer patients looked at differences in coping and distress symptoms for African American, NLW, and Latina women, while controlling for SES (Culver, Arena et al. 2002). Latinas in the study reported significantly more avoidance coping than NLW women and African American women ( $p<0.001$ ), as well as significantly more religious coping than NLW women ( $p<0.001$ ). The avoidance coping mechanisms were positively associated with greater distress around breast cancer status ( $p<0.001$ ) (Culver, Arena et al. 2002). These studies illustrate the disparities in psychosocial morbidity and variations in coping ability for Latina breast cancer survivors, even after controlling for SES. Similar evidence exists for disparities in more comprehensive measures of quality of life in breast cancer survivorship.

### **ETHNIC DISPARITIES IN HEALTH RELATED QUALITY OF LIFE**

Health related quality of life (HRQOL) is widely recognized as an important outcome in breast cancer care. A common measure of breast cancer specific HRQOL is the Functional Assessment of Cancer Therapy-Breast (FACT-B), which uses sub-scales to assess physical, social, emotional, functional, and spiritual well-being in breast cancer patients (Brady, Cella et al. 1997). Studies of multiethnic (NLW, Latino, and African American) samples of breast cancer survivors have found significant ethnic differences in health related quality of life. While controlling for sociodemographic, clinical, and treatment factors one study found that Latinas experienced poorer HRQOL than NLW women (Janz, Mujahid et al. 2009). A study evaluating HRQOL and breast cancer treatment among African American, NLW, and Latina older breast cancer survivors (mean age = 68.7) found that Latinas reported worse HRQOL, while African American breast cancer survivors reported equally good HRQOL compared to NLW women ( $p<0.01$ ) (Maly, Stein et al. 2008). Consistent with these findings, yet another study showed that Latina breast cancer survivors had significantly lower HRQOL composite scores ( $p<0.001$ ) than their NLW counterparts, while African American breast cancer survivors had HRQOL composite scores comparable to those of NLW women ( $p<0.001$ ) (Ashing-Giwa, Tejero et al. 2007).

Disparities in the well-being, coping ability, and health related quality of life of Latina breast cancer survivors compared to NLW women, even after accounting for differences in SES, are evident. The mechanisms and specific sociocultural factors underlying these differences, however, require further investigation. This is especially true given that despite the sociocultural disadvantages associated with Latino ethnicity in the U.S., introduced earlier, there is evidence that some sociocultural factors unique among Latinos may act in a protective fashion and buffer the psychosocial burden of breast cancer diagnosis among Latina breast cancer survivors. Understanding sociocultural components operating as risk or resiliency factors in the breast cancer survivorship experience of Latinas in the U.S. is a necessary next step in developing

culturally appropriate interventions to address the disparities.

### **CULTURAL FACTORS AND THEIR CONTRIBUTION TO SURVIVORSHIP**

Evidence of the contribution of sociocultural factors to sustaining well-being and HRQOL in Latina breast cancer survivors does exist. Qualitative studies have illustrated sociocultural factors, such as spirituality and the role of family, which may positively influence the survivorship experience of Latinas with breast cancer. A focus group study of 18 Latina breast cancer survivors at different stages of survivorship (acute, re-entry, long-term) found that survivors in all three stages perceived social support from family (e.g., husbands and children) as critical. For acute stage survivors this was a source of “empowerment and reassurance to fight the disease,” while for re-entry stage survivors social support made them “optimistic about the future, and more likely to use active coping styles” (Buki, Garcés et al. 2008). Re-entry survivors also cited spiritual support as significant in their experience and HRQOL (Buki, Garcés et al. 2008). Social support, particularly from family, and spirituality were also major themes in Ashing-Giwa’s focus group interviews with 23 Latina breast cancer survivors. Social support was essential to “emotional well-being, care seeking, and treatment adherence.” The overall feeling in the group about spirituality was that although their disease made them feel defenseless, their spiritual faith gave them comfort (Ashing-Giwa, Padilla et al. 2006).

#### ***Spirituality and Social Support***

Spirituality and social support have also been shown to positively influence coping resources in Latina breast cancer survivors (Ashing-Giwa, Padilla et al. 2006; Napoles-Springer, Livaudais et al. 2007). A cross-sectional telephone survey study examining facilitators and barriers to use of cancer support groups by Latinas found that, among the 330 Latina breast cancer survivors who participated, those who received encouragement from family members to attend a cancer support group had seven times higher odds of having attended one than women who received no encouragement (OR=7.04, 95% CI 3.72, 13.30). Additionally, spiritual well-being was inversely associated with ever having attended a support group (OR=0.93, 95% CI 0.89, 0.98) (Napoles-Springer, Ortiz et al. 2007).

To add to the understanding of sociocultural contributors to HRQOL in Latina breast cancer survivors, studies have also explored the role of acculturation. These studies have shown differences in HRQOL for Latina breast cancer survivors based on level of acculturation (Phinney and Flores 2002; Janz, Mujahid et al. 2009). In her study Janz et. al. used the Short Acculturation Scale for Hispanics (SASH) to assess language preference of the Latinas in the sample, and thus divided them into high and low acculturated Latinas. She found that low acculturated Latina breast cancer survivors had significantly ( $p<0.001$ ) lower functional and emotional well-being, and greater breast cancer concerns, than highly acculturated Latina breast cancer survivors when compared to their NLW counterparts (Janz, Mujahid et al. 2009).

Sociocultural influences on the psychosocial impact, HRQOL, and coping abilities of Latina breast cancer survivors have been identified, along with differences in HRQOL based on level of acculturation. The sociocultural influences have remained even after controlling for SES and differences in stage and severity of disease at diagnosis. Unfortunately, not much is known about mechanisms by which they contribute this protective influence on the survivorship experience, or about their relationship to the overall health status of Latina breast cancer survivors.

## **SELF-RATED HEALTH (SRH)**

SRH is a widely accepted measure in epidemiologic and population health research utilized to assess the perceived general health status of individuals (Layes, Asada et al. 2011). It is typically assessed by asking individuals “How would you rate your overall health?” with five response options ranging from “excellent” to “poor.” It is considered a composite measure of mental and physical well-being (Idler, Leventhal et al. 2004; Jylha 2009; Johnson, Carroll et al. 2010; Khan, Amatya et al. 2012). Research is necessary to identify whether the observed ethnic disparities in cancer distress, well-being, and coping translate to disparities in the overall health status of Latina breast cancer survivors. The impact on broader health status is important to understand given the established correlations of health status measures, such as self-rated health (SRH), to mortality and quality of life for individuals with chronic disease (Fayers and Sprangers 2002; Idler, Leventhal et al. 2004; Jylha 2009).

SRH is a well-validated independent predictor of mortality, particularly for individuals with chronic disease. For example, an NHANES I Follow-up Survey study of over 3,000 individuals with circulatory system disease found that, after controlling for race, education, and income, individuals with circulatory disease with SRH of “poor/fair” had a 63% higher hazard of circulatory disease mortality (HR=1.63, 95% CI 1.21-2.19) while those with “good” health had a 34% higher hazard (HR=1.34, 95% CI 1.01-1.79), both compared to individuals who reported “excellent” SRH (Idler, Leventhal et al. 2004). Participants’ self-ratings of health in at least forty other surveys in a diverse array of countries have consistently predicted mortality, even when baseline health status was accounted for (Idler, Leventhal et al. 2004).

Though not on the biological pathway leading to death, SRH can provide a subjective “summary of information about bodily conditions that in one way or another are involved in these biological chains” (Jylha 2009). In this sense SRH is conceptualized as the value assigned to life given its modification by the impairments, functional states, and social opportunities resulting from disease, injury, or treatment. It thus reflects an individual’s psychosocial adaptation as illness progresses.

SRH seems to be a measure of risk for mortality that goes above and beyond what is captured by other demographic and behavioral risk measures. It also captures an individual’s judgment of his/her health built on lifelong experience and knowledge related to health care encounters, specific diseases, and observations of the health of individuals around them. Hypothetically, an individual’s SES and sociocultural context additionally influence this knowledge.

### ***Socioeconomic Status and Self-rated Health***

One of the few U.S. studies exploring prospective associations between SES and SRH followed a large sample of 300,000 NLW and non-Latino African American men and women. The study reported that a greater proportion of individuals in the lowest income bracket rated their health as “fair/poor” (31.2%) than the proportion in the top income bracket (4.7%) (Dowd and Zajacova 2007). This association between SES and SRH could stem from individuals with lower income having actual poorer health, or from having differential reporting or health evaluation standards (Dowd and Zajacova 2007). However, SES may not be the only contributor to differential evaluation of health. Given that the “subjective meaning of what is healthy and what is not is

usually embedded in a social and cultural environment,” it is likely that more nuanced sociocultural factors are involved (Jylha 2009).

### ***Self-rated Health in Latinos***

The influence of sociocultural factors on SRH is substantiated by studies revealing ethnic disparities in SRH across ethnic background after accounting for differences in SES (Shetterly, Baxter et al. 1996; Kandula, Lauderdale et al. 2007). Research on the SRH of Latina breast cancer survivors is not available. However, U.S. Latinos overall often report poorer SRH than NLWs (Shetterly, 1996). A study based on the 2001 California Health Interview Survey revealed that Latinos were more likely to report “fair/poor” health than NLWs (adjusted difference in probability= 0.23 compared to 0.05 for NLWs, 95% CI=0.21,0.25,  $p<0.01$ ). (Kandula, Lauderdale et al. 2007). Importantly, this was found despite the fact that among individuals in the study with “fair/poor” SRH, Latinos were significantly younger (Latino mean age = 41, vs. NLW mean age = 57,  $p<0.01$ ) and healthier than NLWs; 48.2% of NLWs had hypertension and 27.0% had cardiac disease compared to 28.2% of the Latinos having hypertension and 7.9% having cardiac disease ( $p<0.01$ ) (Kandula, Lauderdale et al. 2007). These findings suggest that, just as with psychosocial disparities in Latinas with breast cancer, there is something beyond a low SES profile contributing to disparities in SRH for Latinos. A study similar to Kandula’s confirmed that even after controlling for SES indicators Latinos had greater odds (OR= 2.2, 95% CI= 1.40, 3.79,  $p<0.01$ ) of reporting “fair/poor” SRH compared to NLWs (Shetterly, 1996). Persistent disparities in Latino SRH independent of SES differences have prompted further exploration of the role of culture in health status.

### ***Acculturation and Self-rated Health***

Studies attempting to better understand the role of culture in SRH have focused to a greater extent on the concept of acculturation. While culture is important to understand, it is a dynamic variable. Acculturation has been defined as continuous, firsthand contact with other cultures resulting in an iterative process by which an individual incorporates sociolinguistic and cultural norms of their host country, but also retains norms inherent to their original country (Johnson, 2010). Acculturation is thought to better capture the fluid nature of culture and broad cultural influences on health status among Latinos (Phinney and Flores 2002).

In her study, Shetterly assessed SRH differences within Latinos based on their level of acculturation (Shetterly, Baxter et al. 1996). This study found that Latinos who were most like NLWs in language use and cultural values were also similar to NLWs in SRH rankings (Shetterly, Baxter et al. 1996). A second study evaluating the association between acculturation and SRH using a validated acculturation scale (Acculturation Rating Scale for Mexican Americans-II) and accounting for education level, income, health insurance status, and disease status found that Mexican-oriented Hispanics (a term used based on the acculturation assessment tool) had 3.16 greater odds of reporting “fair/poor” SRH compared to Anglo-oriented Hispanics (95% CI=1.37, 7.25) (Johnson, 2010). Differences in the meaning of the response options across languages, that is, non-equivalent translations, may account for some of these differences. However, Viruell-Fuentes’ study found that even though adjusting for language attenuated differences between NLW and Latinos in the likelihood of rating their health as “fair/poor,” the gap persisted with Latinos still more likely than NLWs to rate their health as “fair/poor” (Viruell-Fuentes, Morenoff et al. 2011).

Another potential explanation for differences in SRH across acculturation level is that Latinos somatize their emotional and mental health in their SRH evaluation (Shetterly, Baxter et al. 1996; Zajacova and Dowd 2011). Somatization is defined as the expression of psychological, emotional, personal, and/or social distress through physical symptoms (Shetterly, Baxter et al. 1996; (Angel and Guarnaccia 1989). In this context somatization stems from the influence of cultural constructs, such as perceived racism, social support, and spirituality, on the mental health of Latinos. Since level of acculturation might make these cultural constructs less or more relevant to mental health, the degree of somatization might vary with level of acculturation, and thus contribute to the observed differences in SRH (Finch, Hummer et al. 2002; Franzini and Fernandez-Esquer 2004).

Though studies have not been conducted with Latina breast cancer survivors, perceived racism, spirituality, and social support, have been shown to contribute to the the health status of Latino populations (Franzini and Fernandez-Esquer 2004). Perceived racism, for example, has been associated with poor mental health in Latinos and exaggerated stress responses that result in poor coping (Finch, Hummer et al. 2002; Franzini and Fernandez-Esquer 2004). Importantly, social support and degree of spirituality have not only been shown to positively influence the health status of Latinos, but also to vary within Latino study populations by level of acculturation. A survey of over 1,000 U.S. and foreign-born Latinos examined physical health, mental health, and SRH across different acculturation levels based on English language ability and nativity. The study reported differences in cultural indicators (such as social support and religiosity), personal indicators (such as trust, education, and income), and SRH across the four categories of acculturation (foreign-born Spanish-speaking, foreign-born English-speaking, U.S.-born Spanish-speaking, U.S.-born English-speaking). U.S.-born English-speakers were more likely to report better SRH than foreign-born Spanish-speakers (OR=1.69,  $p<0.01$ ), and foreign-born Spanish-speakers reported having less social support, lower incomes, and less education overall ( $p<0.001$ ). As far as the relationship between social support, religiosity, and SRH, the study revealed that social support (OR=1.07,  $p=0.07$ ) and religiosity (OR=1.05,  $p<0.01$ ) had a positive association with SRH in the sample (Franzini and Fernandez-Esquer 2004).

Unfortunately, although studies like Franzini's provide details necessary to understanding the complexity of Latino health in the U.S., little research has been done to replicate these findings in Latina breast cancer survivors. The implications of sociocultural factors and acculturation on the SRH of Latina breast cancer survivors' demands further research. This is especially true given the evidence for the role of sociocultural factors and acculturation in psychosocial disparities, coping, and HRQOL for this population.

### **SELF-RATED HEALTH AND BREAST CANCER**

Although a diagnosis of breast cancer clearly affects an individual's perception of their health status, the research on SRH among breast cancer survivors is limited. Studies have compared SRH in cancer survivors of all types of cancer to SRH among non-cancer survivors and found that cancer survivors were more likely to have "fair/poor" SRH after adjusting for various sociodemographic characteristics (Schootman, Deshpande et al. 2010). Among cancer patients, in general, SRH is also known to be more predictive of mortality than performance status measures (Fayers and Sprangers 2002; Shadbolt, Barresi et al. 2002; Johnson, Carroll et al. 2010).

Though not inclusive of Latina breast cancer survivors, one of the few studies of SRH among breast cancer survivors found that in a sample of 832 breast cancer survivors (93% of whom were NLW), 7.6% of those who had rated their health as “excellent” at diagnosis reported “fair/poor” SRH one year later (Schootman, Deshpande et al. 2012). A second study of SRH in a multiethnic (NLW and African American) sample of 2,762 cancer survivors (21% of which were breast cancer survivors) found that “fair/poor” health ratings differed by race. “Fair/poor” SRH was most common among African American cancer survivors (39.3%) compared to NLWs (10.7%) (Schootman, Deshpande et al. 2010).

The limited literature on SRH among cancer survivors has been consistent in demonstrating lower SRH in this patient population, declining SRH for breast cancer survivors after diagnosis, and poorer SRH for ethnic minorities within the general cancer survivor population. More research in SRH among Latino cancer survivors, especially Latina breast cancer survivors, is necessary. The need for this research is substantiated by the fact that disparities in other health status measures, particularly health related quality of life (HRQOL), have been found for Latina breast cancer survivors when compared to NLW and African American women (Ashing-Giwa, Tejero et al. 2007; Maly, Stein et al. 2008; Janz, Mujahid et al. 2009). Importantly, the disparities in HRQOL for Latina breast cancer survivors have also been linked to sociocultural constructs and acculturation. Exploring these in relation to SRH outcomes for Latina breast cancer survivors is also necessary.

### **CANCER SELF-EFFICACY**

In social-cognitive theory, Albert Bandura defines self-efficacy as “the belief in one’s capabilities to organize and execute the courses of action required to manage prospective situations” (Bandura 1997). In other words, self-efficacy is a person’s belief in his or her ability to succeed in a particular situation. Self-efficacy is used as a predictor of intention and behavior that is based on an individual’s sense of control over their environment (Bandura 1997). Given its relationship to control and individual competence in future events it influences effort put forth in “persistence to continue striving despite barriers and setbacks that may undermine motivation,” such as a breast cancer diagnosis (Bandura 1997).

Studies on adaptation to breast cancer have examined two general categories of coping resources: intrapersonal factors (cultural constructs, cancer self-efficacy) and interpersonal factors (social support, physician interaction) (Ashing-Giwa, Tejero et al. 2007; Nápoles, Ortiz et al. 2011). Cancer self-efficacy, defined as an individual’s perceived ability to problem solve and cope with a cancer diagnosis, has been well studied among NLW breast cancer survivors (Merluzzi and Martinez Sanchez 1997; Kreitler, Peleg et al. 2007). Cancer self-efficacy was conceptualized by Merluzzi as a multidimensional construct measured by the Cancer Behavior Inventory (CBI). In the CBI, Merluzzi operationalizes six components of self-efficacy: 1) Maintenance of Activity and Independence; 2) Coping with treatment-related side effects; 3) Accepting Cancer/Maintaining Positive Attitude; 4) Seeking and understanding medical information; 5) Affective regulation; and 6) Seeking support (Merluzzi and Martinez Sanchez 1997). Use of cancer self-efficacy as a measure of self-regulation related to coping among cancer survivors is supported by Merluzzi’s findings that CBI scores were significantly correlated with previously validated measures of disease impact (Sickness Impact Profile), adjustment



(Psychosocial Adjustment to Illness Scale and the Mental Health Index), coping (Mental Adjustment to Cancer Scale), and social support (Interpersonal Support Evaluation List) in a sample of 502 persons with cancer ( $p < 0.05$ ) (Merluzzi and Martinez Sanchez 1997). However, cancer self-efficacy research among Latina breast cancer survivors is lacking.

Though not specific to cancer self-efficacy or Latina breast cancer survivors, evidence exists that, like SRH and HRQOL, self-efficacy among Latinos in general is influenced by sociocultural factors (Burke, Bird et al. 2009). A qualitative study among 29 U.S. born and immigrant Latinas and Filipinas explored the influence and context of self-efficacy in this population. The study found that the domain of social capital played a significant role in perceptions of self-efficacy (Burke, Bird et al. 2009). According to Burke et al. “women differently experienced and perceived self-efficacy depending on their social context.” Through social support from family members or religious institutions the “women accessed benefits such as feelings of trust, support, security, and belonging” (Burke, Bird et al. 2009). Sociocultural (namely social support and spirituality) and economic considerations and expectations, which most of the participants said changed over time, framed women’s experiences and perceptions of self-efficacy. The same is not known for Latinas with breast cancer, but this knowledge is necessary to better understand their survivorship experience.

### **CANCER SELF-EFFICACY AND SRH**

Initial studies of cancer self-efficacy in Latina breast cancer survivors suggest that in addition to its role as an intrapersonal coping resource, it may also be associated with SRH. A survey of 330 Latina breast cancer survivors in Northern California assessed associations between coping resources, like cancer self-efficacy, spiritual well-being, and social support, and SRH (Nápoles, Ortiz et al. 2011). The study concluded that while comorbidities placed Latina breast cancer survivors at increased risk of poor SRH, cancer self-efficacy had a strong protective effect (AOR= 4.95; 95% CI [2.13, 11.47]). In fact, cancer self-efficacy was the only coping resource that remained independently associated with SRH after controlling for level of education, employment status, and co-morbidities. Additionally, in multivariate models, the positive effects of spiritual well-being and social support on SRH were attenuated by cancer self-efficacy. This suggests that these coping resources may be acting on health status through cancer self-efficacy (Nápoles, Ortiz et al. 2011). A separate study examined the role of cancer self-efficacy in pain management in a multiethnic sample (NLW, African American, and Latina) of breast cancer survivors and found that greater cancer self-efficacy was associated with less breast cancer distress ( $r=0.45$ ,  $p < 0.05$ ). Furthermore, lower cancer self-efficacy for seeking and understanding medical information was associated with greater barriers to pain management ( $r=-0.24$ ,  $p < 0.05$ ) (Mosher, DuHamel et al. 2010). These studies support the need for more information about the relationship between cancer self-efficacy and SRH in Latina breast cancer survivors. These relationships should also be examined in the context of acculturation and sociocultural factors previously shown to influence the breast cancer survivorship experience of Latinas in the U.S.

### **SUMMARY**

Latinos are the largest and youngest minority group in the United States. Their low SES profile and limited access to health care put them at risk of poorer health outcomes. In the case of breast cancer Latinas tend to be diagnosed at later stages and with larger tumors than non-Latino White women. There is also evidence that Latina breast cancer survivors experience greater disease

related psychosocial distress and poorer health related quality of life due to unique sociocultural factors. Although the general health status measure of self-rated health has not been thoroughly studied among Latina breast cancer survivors, in the general Latino population self-rated health has been associated with social support, spirituality, and level of acculturation. The limited research on self-rated health among Latina breast cancer survivors has elucidated a possible association between this measure and the intrapersonal factor of cancer self-efficacy. However, the concept of cancer self-efficacy has also been sparsely explored among Latina breast cancer survivors. Finally, knowledge of the influence of acculturation on both cancer self-efficacy and self-rated health among Latina breast cancer survivors is limited.

## QUESTION FORMULATION

Though independent associations have been established between acculturation, self-rated health, and spirituality among the general Latino population, and between self-rated health and cancer self-efficacy in Latina breast cancer survivors, these relationships have not been fully explored. A possible framework for exploring these factors is illustrated in **Figure 1** below. This framework would enhance knowledge of the relationship between acculturation variables (birthplace (U.S.-born versus foreign-born), English speaking ability, and language acculturation) and self-rated health (SRH) in a large sample of (n=330) Latina breast cancer survivors, while controlling for sociodemographic and health variables (age, income, education, insurance status, access to health care, comorbidities, and stage at diagnosis). Additionally, this framework would allow examination of the influence of intrapersonal coping resources (cancer self-efficacy and spirituality) on any relationship between acculturation and SRH.

The framework in **Figure 1** below facilitates formulation of the following research questions:

Q1: Is acculturation (as measured by birthplace, language acculturation, or English speaking ability) associated with self-rated health in Latina breast cancer survivors?

Q2: Is acculturation (as measured by birthplace, language acculturation, or English speaking ability) associated with cancer self-efficacy in Latina breast cancer survivors?

Q3: Does cancer self-efficacy mediate the effects of acculturation on self-rated health in Latina breast cancer survivors?

Q4: Does spirituality mediate the effects of acculturation on self-rated health in Latina breast cancer survivors?

As shown in **Figure 1**, I hypothesize evidence of a relationship between level of acculturation and self-rated health within this sample of Latina breast cancer survivors ( $H_1$ ). I also hypothesize independent relationships between acculturation and each of the intrapersonal coping resources (cancer self-efficacy and spirituality) ( $H_2$ ), and an independent relationship between the coping resources and self-rated health ( $H_3$ ). If these relationships are found, I also hypothesize the direct relationship between acculturation and self-rated health might be attenuated, or mediated, by each of the intrapersonal coping resources separately. The H's in **Figure 1** below indicate these hypotheses. The hypotheses corresponding to the research questions (Q1-Q4) are:

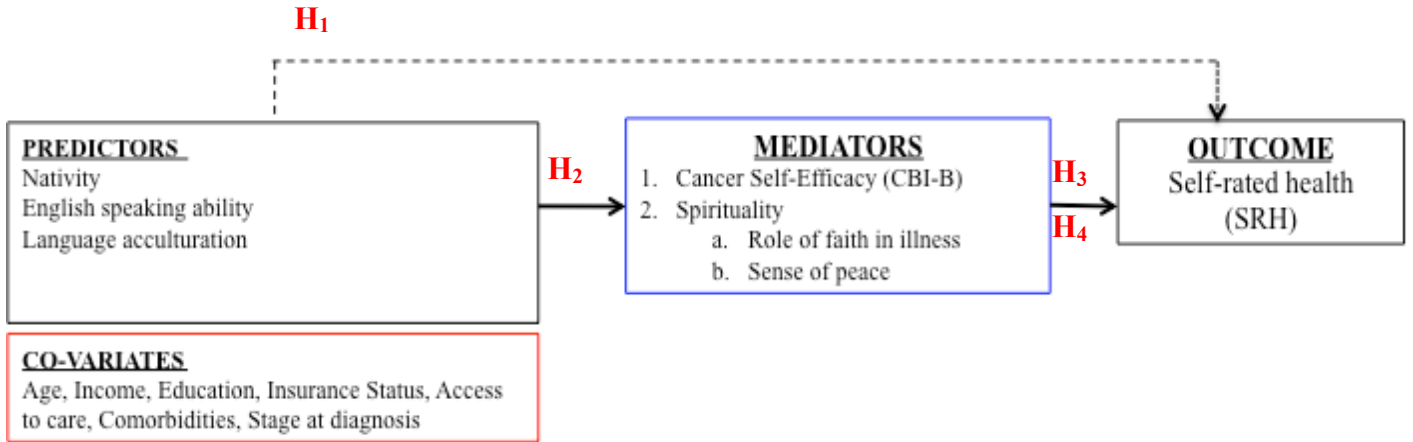
H1: Level of acculturation is associated positively with self-rated health.

H2: Level of acculturation is associated positively with cancer self-efficacy.

H3: The effects of acculturation on self-rated health are mediated partially by level of acculturation.

H4: The effects of acculturation on self-rated health are mediated partially by degree of spirituality.

**Figure 1.** Conceptual Framework



Understanding the roles of acculturation, sociocultural factors, and modifiable intrapersonal characteristics in the survivorship experience of Latinas with breast cancer is essential for addressing health status and psychosocial morbidity disparities among Latina breast cancer survivors in the U.S. These factors can be targeted in effective intervention designs, such as workshops and training sessions, that increase cancer self-efficacy by increasing understanding of breast cancer disease and treatment, and promoting emotional well-being.

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## **Paper 2: Culture and Self-rated Health Among Latina Breast Cancer Survivors: The Role of Cancer Self-efficacy and Spiritual Well-being**

### **ABSTRACT**

#### **Background**

Compared to non-Latino white (NLW) women with breast cancer, Latinas are diagnosed at later stages of disease, with larger tumors, are 20% more likely to die of breast cancer (accounting for age and stage), and experience greater psychosocial distress and poorer health related quality of life. Racial disparities in cancer survivorship persist after accounting for socioeconomic differences, suggesting that cultural or other factors may be operating.

#### **Methods**

Secondary data analysis of a cross-sectional telephone survey of a population-based registry sample of 330 self-identified Latina breast cancer survivors from 4 Northern California counties explored relationships between language acculturation, self-rated health (SRH), cancer self-efficacy, and spiritual well-being.

#### **Results**

English language proficiency was associated significantly with SRH, independent of other sociodemographic characteristics (OR=2.26; 95% CI 1.15, 4.45). Cancer self-efficacy attenuated the effect of English language proficiency on SRH (OR=1.76, 95% CI 0.87, 3.55), and was positively associated with SRH (OR=2.24, 95% CI 1.22, 4.10). Adding sense of peace (a spiritual well-being subscale) attenuated the association of cancer self-efficacy and SRH (OR=1.67, 95% CI 0.88, 3.18). Sense of peace remained associated with SRH (OR= 2.44, 95% CI 1.30, 4.56).

#### **Discussion**

Findings support development of interventions for Latina breast cancer survivors targeting modifiable resiliency factors, like sense of peace/meaning in life and control over breast cancer, in an effort to address disparities health status and quality of life for Latina breast cancer survivors.

## **BACKGROUND**

Latinos constituted over 50% of U.S. population growth between 2000 and 2010 (U.S. Census 2002; Ennis, Rios-Vargas et al. 2011), during which time breast cancer remained the most commonly diagnosed cancer and leading cause of cancer death among Latina women (Siegel, Cokkinides et al. 2009). Latinas with breast cancer experience marked health disparities compared to their non-Latino White (NLW) counterparts. Compared to NLW women with breast cancer, Latinas are diagnosed at later stages of disease, with larger tumors, and are 20% more likely to die of breast cancer (accounting for age and stage) (Singh and Siahpush 2002; Siegel, Cokkinides et al. 2009). Furthermore, Latina breast cancer survivors (BCS) experience greater psychosocial distress and poorer health related quality of life (Singh and Siahpush 2002; Siegel, Cokkinides et al. 2009).

Ethnic disparities in quality of life persist for Latina BCS compared to NLW women after accounting for socioeconomic and treatment differences, suggesting that cultural or other factors may be operating (Kagawa-Singer 1995; Spencer, Lehman et al. 1999; Eversley, Estrin et al. 2005; Yanez, Thompson et al. 2010). Two factors that may help account for these differences, level of acculturation and cancer self-efficacy (sense that one can manage one's cancer), have been associated positively with self-rated health (SRH) and pain management among Latinas with breast cancer (Kagawa-Singer 1995; Spencer, Lehman et al. 1999; Merluzzi, Nairn et al. 2001; Franzini and Fernandez-Esquer 2004; Ashing-Giwa, Tejero et al. 2007; Kandula, Lauderdale et al. 2007; Kreitler, Peleg et al. 2007; Napoles-Springer, Livaudais et al. 2007; Janz, Mujahid et al. 2009; Lockett, Goldstein et al. 2011; Nápoles, Ortiz et al. 2011; Khan, Amatya et al. 2012). Another factor, spirituality, also has been associated positively with perceived health, especially among ethnic minority BCS (Ashing-Giwa, Padilla et al. 2006; Buki, Garcés et al. 2008; Nápoles, Ortiz et al. 2011). However, to date, no one has examined the degree to which Latina BCS's perceived health varies with level of acculturation, or if the positive relationship between cancer self-efficacy or spirituality and self-rated health holds across Latina BCS with varying levels of acculturation.

### ***Theoretical Framework***

Prominent psychosocial models of adaptation to cancer combine social-cognitive theory (Bandura 1997) with coping theory (Lazarus 1993), while emphasizing the social context of disease (Brennan 2001). Similar to multidimensional sociocultural models of quality of life in survivorship (Kagawa-Singer, Padilla et al. 2010), a psychosocial model posits social, cultural, cognitive, and spiritual dimensions in adaptation to cancer. Such models of cancer survivorship and adaptation are supported by evidence of intrapersonal (cancer self-efficacy), interpersonal (social support), and cultural factors (spirituality) affecting well-being and quality of life among cancer survivors (Cunningham, Lockwood et al. 1991; Ashing-Giwa, Padilla et al. 2004; Kagawa-Singer, Padilla et al. 2010; Mosher, DuHamel et al. 2010; Samarco and Konecny 2010). These models are useful in contextualizing this study's variables of interest given the aim of assessing the role of intrapersonal and cultural factors in self-rated health, a concept complementary to quality of life in capturing self-perceived physical and functional well-being (Ashing-Giwa, Tejero et al. 2007).



### ***Cancer Self-efficacy and Spiritual Well-being***

Cancer self-efficacy, defined as a person's belief in his/her ability to succeed in a particular situation given his/her cancer status, is a predictor of behavior based on an individual's sense of control over their environment (Bandura 1997). Spiritual well-being is a measure of spirituality that captures religious and non-religious sources of faith and inner peace. Both cancer self-efficacy and spiritual well-being are intrapersonal resources that have been implicated in adaptation to breast cancer (Ashing-Giwa, Padilla et al. 2006; Kreitler, Peleg et al. 2007; Napoles-Springer, Ortiz et al. 2007). These constructs may be rooted in cultural beliefs and, thus may differ by ethnicity and level of acculturation. However, we know little about how these constructs differ by level of acculturation among Latina BCS, or how the various components of spiritual well-being may affect SRH.

Among both NLW and Latina BCS, cancer self-efficacy has been associated with better health outcomes. Among NLW BCS self-efficacy for coping with cancer (coping with treatment side-effects, seeking support, maintaining hope, etc.) has been associated with better psychosocial adjustment (Merluzzi and Martinez Sanchez 1997; Kreitler, Peleg et al. 2007; Nápoles, Ortiz et al. 2011). Among Latina BCS overall, cancer self-efficacy has been positively associated with better self-reported health (Nápoles, Ortiz et al. 2011); however, whether this relationship differs by level of acculturation is unknown.

Spirituality has been linked to better quality of life for people with cancer (Brady, Cella et al. 1997). Among Latina BCS it is an important coping resource in recovery from breast cancer in that it enhances hope and lessens fear (Juarez, Ferrel et al. 1998; Taylor 2001; Culver, Arena et al. 2002; Ashing-Giwa, Padilla et al. 2004; Napoles-Springer, Ortiz et al. 2007; Burke, Bird et al. 2009).

### ***Acculturation***

Acculturation is defined as an iterative, continuous process by which individuals incorporate sociolinguistic and cultural norms of their host country, while retaining norms inherent to their original country (Berry 2003; Thomson and Hoffman-Goetz 2009; Johnson, Carroll et al. 2010). Acculturation captures the fluid, multidimensional nature of culture and is measured by proxies, such as nativity, generation, and language proficiency (Phinney and Flores 2002; Thomson and Hoffman-Goetz 2009). Language proficiency is a particularly useful acculturation measure in health disparities research because of its central role in influencing the ability to seek, understand, and apply health information (Carter-Pokras and Bethune 2009). Among Latino populations acculturation has been positively associated with self-rated health (Shetterly, Baxter et al. 1996; Franzini and Fernandez-Esquer 2004; Kandula, Lauderdale et al. 2007). However, these concepts and their interrelationships have not been explored among Latina BCS.

### ***Self-rated health***

Self-rated health (SRH) is a widely accepted and well-validated measure of self-perceived general health status, which independently predicts mortality among individuals with chronic disease (Layes, Asada et al. 2012). Among cancer patients, SRH is a better predictor of survival than performance status or quality of life measures (Fayers and Sprangers 2002; Shadbolt, Barresi et al. 2002; Johnson, Carroll et al. 2010). Spiritual well-being and cancer self-efficacy have been shown to be positively correlated with SRH (Franzini and Fernandez-Esquer 2004;

Nápoles, Ortiz et al. 2011), but whether they may mediate the relationship of acculturation to SRH among Latinas with breast cancer has not been explored.

In sum, independent associations exist between acculturation and spirituality with SRH among the general Latino population. Additionally, studies suggest that cancer self-efficacy and spiritual well-being are positively associated with SRH among Latina BCS. However, the relationship between these coping resources and SRH in the context of acculturation has not been fully explored among Latina BCS. Guided by psychosocial and sociocultural models of coping this exploratory study investigates the influence of acculturation indicators and intrapersonal factors on perceived health status (self-rated health) among Latina BCS. This study aims to assess among Latina BCS the association between various acculturation measures and SRH, as well as the roles of spiritual well-being and cancer self-efficacy as potential mediators of this association. Based on the models stated above, we hypothesize that greater acculturation is associated positively with SRH, and that this relationship is partially mediated by spiritual well-being and cancer self-efficacy.

## **RESEARCH DESIGN AND METHODS**

### *Participants*

The aim of the parent study that was the source of the data for the present analyses was to identify predictors of cancer support group utilization among Latina BCS, through a cross-sectional population-based telephone survey conducted between April and September of 2004. Participants were self-identified Latina BCS in four northern California counties who were identified using a population-based cancer registry of the National Cancer Institute Surveillance, Epidemiology, and End Results (SEER) Program (Greater Bay Area Cancer Registry, 2005), and whose attending physician at the time of diagnosis consented to their being contacted for telephone follow-up. After obtaining consent from physicians, women were mailed a low-literacy initial contact letter and acceptance/refusal postcard in low-literacy English and Spanish. Participants were paid \$20 in cash for completing the survey (Napoles-Springer, Ortiz et al. 2007).

Women of any age and national origin were eligible to participate in the study if they: 1) self-identified as Latina; 2) were diagnosed with their first in-situ, localized, or regional stage breast cancer between 1999-2002 (within five years of the original survey); and 3) resided in Alameda, Contra Costa, Santa Clara, or Santa Cruz county. Women were not included in the study if they: 1) had metastatic (Stage IV) breast cancer; 2) were too sick to participate (based on self-report); or 3) had cognitive impairment compromising the quality of the interview as judged by the interviewer. Women with metastatic cancer were excluded since their psychosocial issues may differ from those with non-metastatic disease (e.g., greater focus on existential issues or symptom relief) (Smith 2006).

### *Data Collection*

Two weeks after mailing of the initial letter, women who did not return a refusal postcard were contacted by telephone by an experienced bilingual-bicultural interviewer who obtained verbal informed consent prior to the telephone interview. The secondary data project that is the focus of this article was conducted using a de-identified dataset, therefore, the Institutional Review

Board at the University of California San Francisco determined this study did not constitute human subjects research.

### *Measures*

All variables were collected via self-report unless otherwise stated. Covariates included demographic and clinical characteristics and consisted of: ethnicity (including Latino subgroup), education level (0-6<sup>th</sup> grade, 7<sup>th</sup> grade to high school degree/GED, and beyond high school), employment status (employed versus unemployed), health insurance type (private, public, or none), age in years, presence of comorbid chronic health conditions (dichotomized as yes or no), type of surgery received (breast conserving surgery versus mastectomy), and tumor registry reported stage at diagnosis.

Predictor variables included acculturation indicators of English language proficiency, language acculturation, and country of origin (U.S.- versus foreign-born). English language proficiency was based on the item "How well do you speak English?" and dichotomized as English proficient (EP; responded very well/well) versus limited English proficient (LEP; responded fairly well/poorly/not at all). Language acculturation was assessed using the Short Acculturation Scale for Hispanics (SASH). The SASH is a 12-item language acculturation measure derived from a previously validated scale (Marin, Sabogal et al. 1987). In practice, based on psychometric results, the scale has been shortened to four items that ask about language use in four contexts (read and speak in general, speak at home, usually think in, and speak with friends) with the following response options: 1=only Spanish; 2=Spanish better/more than English; 3=both equally; 4=English better/more than Spanish; and 5=English only (Hamilton, Hofer et al. 2009; Janz, Mujahid et al. 2009; Nápoles, Ortiz et al. 2011). Mean language acculturation scores were dichotomized as  $\leq 2.99$  = "low acculturation level" and scores  $> 2.99$  = "high acculturation level" (Marin, Sabogal et al. 1987). Country of origin was assessed with the single question "In what country were you born?" with the response options "U.S." and "Other."

Potential mediators included three intrapersonal characteristics: a cancer self-efficacy scale and two spiritual well-being subscales. The self-efficacy for coping with breast cancer scale was adapted from the Cancer Behavior Inventory-Breast Cancer (CBI-B) version 2 (Merluzzi, Nairn et al. 2001). Because the CBI-B version 2 was not available in Spanish prior to the original study, a team of bilingual-bicultural researchers developed a Spanish version of the full scale using rigorous forward-backward translation, cognitive pre-testing, and psychometric methods. Eight of the original 14 items were dropped based on pre-testing and psychometric results (Nápoles-Springer, Ortiz et al. 2007). The final 6-item cancer self-efficacy scale used in these analyses assessed respondents' confidence in seeking and understanding medical information, accepting their cancer, maintaining a positive attitude, and seeking social support. The scale score (possible range=1-4) was the mean of non-missing items with a higher score indicating a greater sense of cancer self-efficacy.

Spiritual well-being was assessed using a previously validated and translated 12-item Spiritual Well-being scale of The Functional Assessment of Cancer Therapy Quality of Life Measurement System- Spiritual Well-being (FACIT-Sp, version 4) (Peterman, Fischett et al. 2002). Based on prior principal components analysis, eight of the 12 items assess sense of peace and can be scored as a subscale (Peterman, Fischett et al. 2002). The Sense of Peace subscale score was

calculated per instructions, as the mean of non-missing items (possible range=0-32) with a higher score indicating a greater sense of peace. This subscale assesses a sense of meaning, inner peace, and purpose in life, independent of religious beliefs (e.g. feeling peaceful, having a reason for living, being productive, feeling harmony within self). The remaining 4-item subscale labeled Faith assesses aspects of the relation between illness and one’s faith/spiritual beliefs (e.g. finding comfort and strength in spiritual beliefs) (Peterman, Fischett et al. 2002).

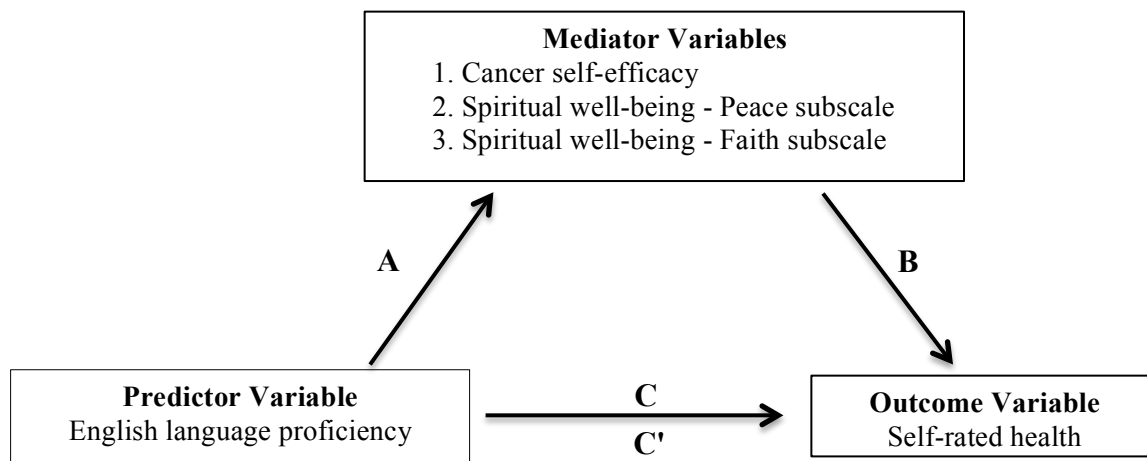
The outcome variable was self-rated health (SRH) as measured by the single item “In general, how would you rate your health?” with response options: 1=poor; 2=fair; 3=good; 4=very good; or 5=excellent (Jylha 2009; Zajacova and Dowd 2011). The item was dichotomized into fair/poor versus good/very good/excellent (Shetterly, Baxter et al. 1996; Finch, Hummer et al. 2002; Shadbolt, Barresi et al. 2002; Layes, Asada et al. 2012).

*Analysis*

Descriptive statistics were used to characterize the sample. Pearson's correlations between acculturation indicators were examined. Acculturation variables were also examined for potential co-linearity. Then, using simple logistic regression, we examined bivariate relationships of the acculturation indicators with the outcome (SRH), covariates, and potential mediators (cancer self-efficacy, sense of peace, and faith). Only covariates that were related to SRH at  $p < 0.15$  in the bivariate analyses were retained in the multivariate logistic regression models. Hypothesized mediators related to SRH at  $p < 0.15$  in the bivariate analyses were included in the multivariate models.

The mediation analyses were conducted as recommended by Baron and Kenny mediation framework (Baron and Kenny 1986) to test if the hypothesized mediators (e.g., cancer self-efficacy) mediated the relationship of acculturation to SRH. The Baron and Kenny mediation analysis requires four steps to establish mediation (Figure 1): 1) significant association between the predictor variable and outcome variable, without the mediator variable of interest in the model, (path C); 2) significant association between the predictor variable and mediator variable without the outcome variable in the model (path A); 3) significant association between the mediator variable and the outcome variable with the predictor variable in the model (Path B); and 4) the relationship between the predictor and outcome variable should be attenuated when the mediator variable is also included in the model (Path C'). Models establishing each of these criteria should all include the same set of covariates.

**Figure 1.** Baron and Kenny Mediation Framework



Because this study had multiple mediators of interest, the four mediation steps were modeled for each mediator separately. Multivariate logistic regression analyses were conducted to establish each of the criteria mentioned above with each of the potential mediators that were related to SRH at  $p < 0.15$  in bivariate analyses. The predictor variables (acculturation indicators significantly associated with SRH in bivariate analyses at  $p < 0.15$ ), outcome variable (SRH), and covariates (demographic and clinical indicators significantly associated with SRH in bivariate analyses at  $p < 0.15$ ) remained constant in all of the analyses.

Based on the results of the bivariate and mediation analyses, a final multivariate logistic regression model estimated the odds of better (good/very good/excellent) SRH as the outcome. This final model included confirmed mediators identified in the separate mediation analyses, the acculturation indicator most strongly related to SRH in bivariate analysis, and all covariates related to SRH at  $p < 0.15$  in bivariate analyses.

## RESULTS

### *Participant Characteristics*

The sampling frame for the original survey study consisted of 1,133 eligible women according to tumor registry data; 29% (n=333) were unable to be contacted, 22% (n=249) were ineligible because of misclassification of ethnicity, 14% (n=161) declined, and 6% (n = 60) were deceased or too ill. Out of 491 women who were eligible and able to be reached by telephone, a total of 330 women completed the survey for a 67% response rate (29% of the sampling frame). Compared to non-participants, participants were younger at time of interview ( $\bar{x}$  = 58.3 versus 61.4 years,  $p < 0.001$ ) and at diagnosis ( $\bar{x}$  = 55.8 versus 58.2 years,  $p < 0.001$ ), and less likely to have well-differentiated tumors (14% versus 19%,  $p < 0.05$ ). There were no significant differences between participants and non-participants by county of residence or stage at diagnosis.

Participants' mean age was 58.3 years (range=30-90 years; SD 11.9), almost 70% had a high school education or less, and only 40% were employed. Sixty percent were foreign-born and 62% were English proficient (Table 1). Approximately 70% were of Mexican origin, 14% were Central American, and 7% were South American. Two-thirds were privately insured and almost one-third publicly insured, with 3% uninsured.

Slightly less than 20% reported a comorbid chronic condition, consisting mostly of hypertension, diabetes, or arthritis. About 60% of the women had a mastectomy and almost all were within two to three years of diagnosis when interviewed (283; 85.8%). The mean cancer self-efficacy score was 3.43 (SD 0.59) on a 1-4 scale and the mean spiritual well-being sense of peace subscale score was 26.6 (SD 5.31) on a scale of 0-32. About one-quarter of them reported being in poor/fair health (Table 2).

### *Bivariate Analyses*

Regarding the acculturation indicators, only the single item, self-reported English language proficiency variable was used in the multivariate models due to its co-linearity with country of origin ( $r = 0.61$ ) and the SASH language acculturation scale score ( $r = 0.80$ ), and its stronger association with the outcome variable of interest in bivariate analysis ( $p < 0.001$ , versus  $p = 0.139$  for country of origin and  $p = 0.026$  for SASH score). Regarding the covariates, age at time of

interview and stage at diagnosis were not included in the multivariate analyses because they were not significantly associated with either self-reported English language proficiency ( $p=0.478$  for age and  $p=0.227$  for stage at diagnosis) or SRH ( $p=0.965$  for age and  $p=0.897$  for stage at diagnosis) in bivariate analyses. Regarding the hypothesized mediators, the Faith subscale was not included in the analyses due to lack of significant associations with English language proficiency ( $p=0.479$ ) or SRH ( $p=0.385$ ) in bivariate analyses.

In bivariate analyses higher level of education, being employed, not having comorbid conditions, having breast-conserving surgery, greater cancer self-efficacy (vs. less), and greater sense of peace (vs. less) were associated with English proficiency (vs. limited English proficiency) at  $p \leq 0.001$ . In bivariate analyses, education level ( $p = 0.479$ ) and employment status ( $p=0.025$ ) were significantly and positively associated with SRH. Having insurance ( $p = 0.115$ ) and breast-conserving surgery ( $p = 0.109$ ) were also significantly associated with better SRH. Not having comorbidities, greater cancer self-efficacy, and greater sense of peace were all associated with better SRH at  $p \leq 0.001$ .

### *Mediation Analyses*

Multivariate logistic regression analysis for mediation first established a significant association between English language proficiency and SRH while controlling for education level, employment status, type of health insurance, comorbid conditions, and type of surgery. English proficient women were more than twice as likely to rate their health as good/very good/excellent than LEP women (OR= 2.26, 95% CI= 1.15, 4.45; Table 3, Model 2; Figure 2, path C).

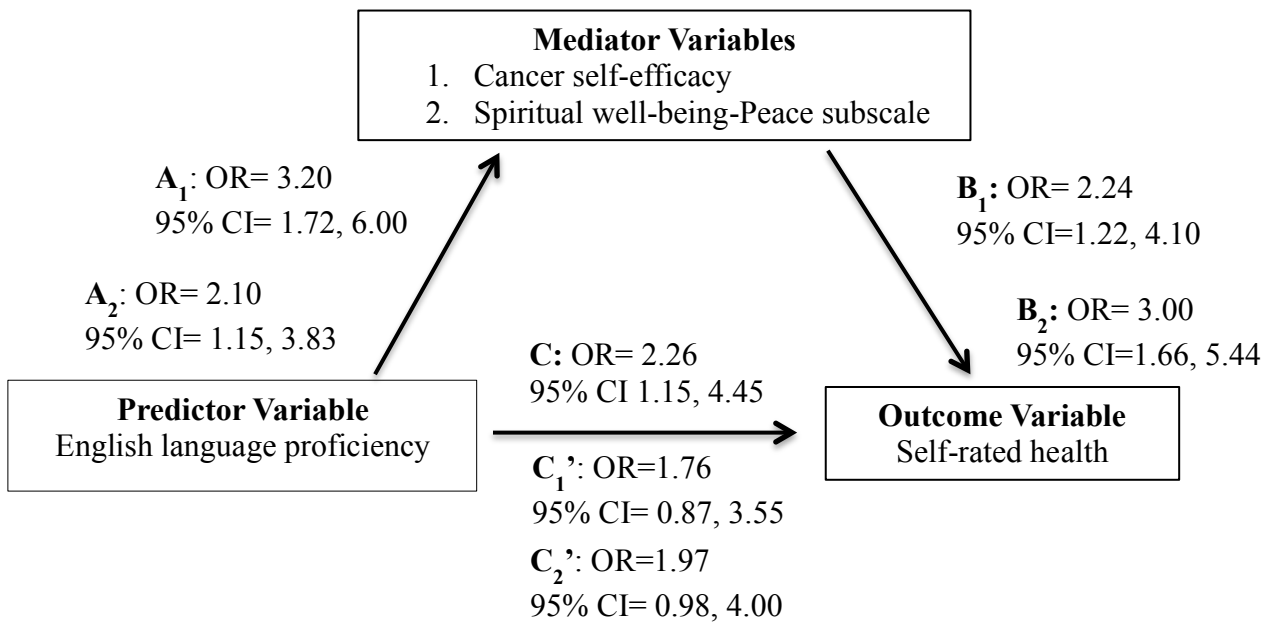
Next, a significant association between English language proficiency and each of the mediators of interest (cancer self-efficacy and sense of peace) had to be established. While controlling for the covariates mentioned above, English language proficiency was associated with cancer self-efficacy, such that English proficient women were more than three times as likely to have greater cancer self-efficacy than LEP women (OR= 3.20, 95% CI= 1.72, 6.00; results not tabled; Figure 2, path A<sub>1</sub>). In a separate model not including cancer self-efficacy, but including all covariates, English language proficiency was significantly associated with sense of peace (OR= 2.10, 95% CI= 1.15, 3.83; results not tabled; Figure 2, path A<sub>2</sub>), such that English proficient women were twice as likely as LEP women to report a greater sense of peace.

The third step was to establish significant relationships between the mediator variables and SRH, while controlling for covariates and English language proficiency. This analysis was conducted for each of the mediator variables separately. When cancer self-efficacy was in the model that included the covariates and English proficiency (without sense of peace), it was positively and significantly associated with SRH (OR = 2.24, 95% CI = 1.22, 4.10; Table 3, Model 3; Figure 2, path B<sub>1</sub>) and English language proficiency was no longer significantly associated with SRH (OR = 1.76, 95% CI = 0.87, 3.55; Table 3, Model 3; Figure 2, path C<sub>1</sub>). When sense of peace was in the model that included the covariates and English proficiency (without cancer self-efficacy), it was also significantly associated with SRH (OR= 3.00, 95% CI=1.66, 5.44; not tabled; Figure 2, path B<sub>2</sub>), and English language proficiency was again no longer significantly associated with SRH (OR = 1.97, 95% CI = 0.98, 4.00; not tabled; Figure 2, path C<sub>2</sub>). In each model, the indirect effects of cancer self-efficacy and sense of peace independently accounted for the effect of English language proficiency on SRH. This satisfied the fourth step of the Baron and Kenny mediation analysis (Figure 2).

*Final Multivariate Model*

The final model included all covariates and both confirmed mediator variables. When both cancer self-efficacy and sense of peace were in the multivariate model, along with English proficiency and the covariates, cancer self-efficacy was not significantly associated with SRH, but sense of peace remained positively associated (OR= 2.44 95% CI=1.30, 4.56) (Table 3, Model 4). This suggests sense of peace attenuated the effect of cancer self-efficacy on SRH and explains much of the effect of English proficiency on SRH.

**Figure 2.** Mediation Analyses Results



## **DISCUSSION**

This study examined relationships between acculturation (English language proficiency), cancer self-efficacy, sense of inner peace, and faith, with self-rated health (SRH) among Latina breast cancer survivors. English proficiency was found to be positively associated with SRH, and cancer self-efficacy and sense of peace were found to mediate this relationship, with sense of peace being more strongly related to SRH than cancer self-efficacy. Faith, however, was not associated with English proficiency or SRH.

As in studies with non-cancer survivor Latino populations (Shetterly, Baxter et al. 1996) acculturation was found to influence SRH such that English proficient women were more likely than limited English proficient women to report better SRH. Cancer self-efficacy was also positively associated with SRH, a finding consistent with previous studies among both NLW women and Latinas (Taylor 2001; Kreitler, Peleg et al. 2007; Nápoles, Ortiz et al. 2011). Additionally, cancer self-efficacy partially explained the relationship between English proficiency and SRH.

Though spiritual well-being has previously been assessed in similar populations (Nápoles, Ortiz et al. 2011), the subscales (sense of peace and faith) of this construct had not been explored, nor had differences by level of acculturation. In this study assessing spiritual well-being subscales provided unique findings. While sense of peace was associated with language ability and SRH, faith was not. More importantly, sense of peace was a mediator of the relationship between language and SRH, and it attenuated the effect of cancer self-efficacy on this relationship. Studies utilizing the full spiritual well-being scale have shown its association with SRH, and postulated spiritual well-being may act on health status through cancer self-efficacy. However, the results of this study suggest cancer self-efficacy may act on self-rated health through components of spiritual well-being related to a sense of peace and meaning in one's life. In this case a greater sense of inner peace may lead to a more positive context for disease status and thus a greater confidence in ability to cope (greater cancer self-efficacy), and ultimately better perceived health. These findings are consistent with a prior study that documented benefit-finding (sense of meaning after cancer) was associated with better health (Antoni, Lehman et al. 2001).

In this study, having a sense of inner peace/meaning in life was protective, but the influence of a religious source of spiritual well-being was not. The content of the spiritual well-being subscales provides insight into these findings. While the sense of peace subscale items inquire about feeling peaceful, having reasons for living, feeling productive in life, and having a sense of purpose in life, the faith subscale items inquire about comfort and strength garnered through faith/religion. One can postulate that having an inner sense of peace is more strongly related to one's perceived general health status than the comfort derived from spiritual beliefs. The relationship of sense of peace, language ability and SRH could be one in which English proficiency makes navigating tasks associated with cancer survivorship (and self-efficacy for managing cancer) less stressful, thus there are less concerns around health status and greater peace of mind.

Further studies on sources of sense of peace for Latina BCS are necessary, as is the development of interventions and availability of resources that may increase sense of inner peace and cancer



self-efficacy for this population, especially for those with limited English proficiency. Increasing sense of purpose and harmony in life, or feelings of peacefulness, could be achieved through increasing opportunities for Latina BCS to contribute to their communities as peer educators for other Latina BCS or Latino cancer survivors in general. This would be consistent with cultural models of *promotores* as positive health agents in their communities. Potential interventions suggested by our findings include culturally and linguistically appropriate meditation or mindfulness-based practices for Latina BCS, either individually or in groups. Such interventions that increase positive emotions about life meaning and peace have been found to reduce cancer-symptoms and medical visits for cancer-related morbidities (Stanton, Danoff-Burg et al. 2002). Increasing awareness among health professionals working with Latina BCS of their increased risk of psychological distress and their need for emotional support is indicated also. Systematic screening for psychological distress during health care visits may be warranted; tools for screening for depressive symptoms for use in clinical settings are available in Spanish (Kroenke, Spitzer et al. 2001; NCCN 2003). Increasing the availability of linguistically appropriate services and breast cancer information, and promoting their participation in treatment decisions and question asking, is also necessary for Latina BCS.

### *Limitations*

The current study had several limitations. The data analyzed was collected from slightly less than one third of the sampling frame identified by the national cancer registry for the original study, thus, findings may not be representative.

Additionally, because the sample overwhelmingly self-identified as Mexican/Mexican-American, the results may only be applicable to this Latino sub-group. Finally, the data comes from a cross-sectional survey. Because the temporal sequence of the cancer coping resources and health status is unknown, causation cannot be inferred. Alternative explanations for the mediation hypotheses are reverse causation, (better self-rated health causes a greater sense of peace), that an omitted variable may be causing both sense of peace and SRH, or measurement error.

### *New Contribution to the Literature*

This study identified a role for language and acculturation in self-rated health, and confirmed previously postulated relationships between modifiable intrapersonal resources (i.e. spirituality and cancer self-efficacy) and self-rated health among Latina breast cancer survivors. Findings suggest that regardless of level of acculturation, better perceived health status, and perhaps better quality of life, may be attainable for Latina breast cancer survivors within five years of their diagnosis if they have a greater sense of peace and cancer self-efficacy. These findings could inform potential interventions promoting well-being, particularly sense of peace, and cancer self-efficacy among Latina breast cancer survivors. They also indicate that Latinas who are LEP are at increased risk of poorer self-rated health, indicating that physicians should focus special efforts on screening such women for potential psychosocial and physical health issues.

**Table 1.** Sample demographics and clinical characteristics.S

| <b>Sociodemographic Characteristic</b> |   | <b>N (%)</b> |
|--|---|--------------|
| Age                                    |   |              |
| $\bar{X}$ age =58.3 (SD 11.9)          |   |              |
|  | 30-49   | 83 (25)      |
|  | 50-59   | 102 (31)     |
|  | 60-69   | 79 (24)      |
|  | 70-90   | 64 (20)      |
| Education level                        |   |              |
|  | 6 <sup>th</sup> grade or less                     | 86 (27)      |
|  | 7 <sup>th</sup> grade to high school graduate/GED | 134 (42)     |
|  | Beyond high school graduate                       | 97 (31)      |
| Employment status                      |   |              |
|  | Employed  | 130 (40)     |
|  | Unemployed  | 199 (60)     |
| Type of Health Insurance               |   |              |
|  | Private   | 214 (66)     |
|  | Public  | 102 (31)     |
|  | None  | 9 (3)        |
| <b>Clinical Characteristics</b>        |   | <b>N (%)</b> |
| Type of Health Insurance               |   |              |
|  | Private   | 214 (66)     |
|  | Public  | 102 (31)     |
|  | None  | 9 (3)        |
| Comorbidities                          |   |              |
|  | Yes   | 58 (18)      |
|  | No  | 272 (82)     |
| Stage at diagnosis                     |   |              |
|  | In situ/Localized                                 | 228 (69)     |
|  | Regional  | 100 (31)     |
| Type of surgery received               |   |              |
|  | Breast conserving surgery                         | 126 (38)     |
|  | Mastectomy  | 186 (56)     |
|  | No response                                       | 18 (6)       |

**Table 2.** Acculturation characteristics, intrapersonal characteristics, and SRH.

| <b>Acculturation Characteristics</b>            |                                   | <b>N (%)</b>      |
|---|-----------------------------------|-------------------|
| Country of origin                               |                                   |                   |
|   | U.S.                              | 134 (41)          |
|   | Other                             | 195 (59)          |
| English language proficiency <sup>1</sup>       |                                   |                   |
|   | English proficient                | 204 (62)          |
|   | Limited English proficiency (LEP) | 126 (38)          |
| Language acculturation scale score <sup>1</sup> |                                   |                   |
|   | High acculturation                | 168 (51)          |
|   | Low acculturation                 | 161 (49)          |
| <b>Intrapersonal Coping Resources</b>           |                                   | <b>Score (SD)</b> |
| Cancer self-efficacy (CBI-B v.2)                |                                   |                   |
|   | <i>(1-4 scale)</i>                | 3.43 (0.59)       |
| Spiritual Well-being (FACIT-SP v.4)             |                                   |                   |
|   | <i>(0-48 scale)</i>               | 40.90 (7.00)      |
| Spiritual Well-being: Peace subscale            |                                   |                   |
|   | <i>(0-32 scale)</i>               | 26.63 (5.31)      |
| Spiritual Well-being: Faith subscale            |                                   |                   |
|   | <i>(0-16 scale)</i>               | 14.20 (2.99)      |
| <b>Self-rated Health</b>                        |                                   |                   |
|   | Good/Very Good/Excellent          | 240 (73)          |
|   | Poor/Fair                         | 90 (27)           |

<sup>1</sup>English language proficiency was based on the single item “How well do you speak English?” Responses of “not at all,” “poorly,” or “fairly well” were coded as limited English proficient (LEP), while “Well” or “Very well” were coded as English proficient. Language acculturation was based on the SASH 4 item scale, with scores of 2.99 or less (out of 5) coded as low acculturation (Spanish dominant) and scores greater than 2.99 coded as high acculturation (English dominant).

**Table 3.** Adjusted odds ratios of English proficiency and better self-rated health among Latina breast cancer survivors

| <i>Covariate variables</i>                 | <b>Model 1</b><br><i>OR (95% CI)</i> | <b>Model 2</b><br><i>OR (95% CI)</i> | <b>Model 3</b><br><i>OR (95% CI)</i> | <b>Model 4</b><br><i>OR (95% CI)</i> |
|--|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| <b>Education level</b>                     |                                      |                                      |                                      |                                      |
| 0-6 <sup>th</sup> grade                    | [1]                                  | [1]                                  | [1]                                  | [1]                                  |
| 7 <sup>th</sup> grade-H.S. diploma/GED     | 1.41 (0.72, 2.74)                    | 0.98 (0.47, 2.05)                    | 0.95 (0.45, 2.03)                    | 1.03 (0.48, 2.23)                    |
| More than high school                      | 1.78 (0.81, 3.96)                    | 1.16 (0.48, 2.80)                    | 1.08 (0.4, 2.66)                     | 1.10 (0.44, 2.75)                    |
| <b>Employment status</b>                   |                                      |                                      |                                      |                                      |
| Unemployed                                 | [1]                                  | [1]                                  | [1]                                  | [1]                                  |
| Employed                                   | 1.25 (0.66, 2.35)                    | 1.31 (0.69, 2.47)                    | 1.28 (0.67, 2.45)                    | 1.37 (0.70, 2.67)                    |
| <i>Clinical characteristics</i>            |                                      |                                      |                                      |                                      |
| <b>Presence of comorbid conditions</b>     |                                      |                                      |                                      |                                      |
| Yes  | [1]                                  | [1]                                  | [1]                                  | [1]                                  |
| No   | 3.51 (1.79, 6.87)                    | 3.35 (1.70, 6.60)                    | 3.27(1.63, 6.57)                     | 3.56 (1.74, 7.26)                    |
| <b>Type of surgery</b>                     |                                      |                                      |                                      |                                      |
| Mastectomy                                 | [1]                                  | [1]                                  | [1]                                  | [1]                                  |
| Breast conserving therapy                  | 1.22 (0.68, 2.21)                    | 1.16 (0.64, 2.10)                    | 1.00 (0.55, 1.85)                    | 0.93 (0.50, 1.72)                    |
| <b>Type of health insurance</b>            |                                      |                                      |                                      |                                      |
| None                                       | [1]                                  | [1]                                  | [1]                                  | [1]                                  |
| Public                                     | 0.45 (0.05, 3.90)                    | 0.39 (0.04, 3.37)                    | 0.40 (0.04, 3.53)                    | 0.36 (0.04, 3.29)                    |
| Private                                    | 0.41 (0.05, 3.50)                    | 0.29 (0.03, 2.51)                    | 0.31 (0.04, 2.79)                    | 0.26 (0.03, 2.40)                    |
| <i>Language acculturation</i>              |                                      |                                      |                                      |                                      |
| <b>English proficiency</b>                 |                                      |                                      |                                      |                                      |
| Limited English proficient                 | ----                                 | [1]                                  | [1]                                  | [1]                                  |
| English proficient                         | ----                                 | 2.26 (1.15, 4.45)                    | 1.76 (0.87, 3.55)                    | 1.71 (0.83, 3.50)                    |
| <i>Intrapersonal resources</i>             |                                      |                                      |                                      |                                      |
| <b>Cancer self-efficacy</b>                |                                      |                                      |                                      |                                      |
| Low  | ----                                 | ----                                 | [1]                                  | [1]                                  |
| High                                       | ----                                 | ----                                 | 2.24 (1.22, 4.10)                    | 1.67 (0.88, 3.18)                    |
| <b>Spiritual Wellbeing- Peace subscale</b> |                                      |                                      |                                      |                                      |
| Low  | ----                                 | ----                                 | ----                                 | [1]                                  |
| High                                       | ----                                 | ----                                 | ----                                 | 2.44 (1.30, 4.56)                    |

\*\* Adjusted OR models include education, employment status at time of interview, insurance type, type of surgery, and presence of comorbidities as covariates.

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