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Role of Physician Involvement on Latinas' Mammography Screening Adherence

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Abstract

Background—Disparities in breast cancer (BC) screening continue to affect Latinas significantly but the factors that explain these disparities remain unclear.

Objective—The objective of this study was to investigate whether physician's instruction on breast examination and mammography recommendations predicted Latinas' adherence to mammography screening above and beyond other influential variables.

Methods—A cross-sectional, descriptive design was utilized. Convenience and snowball sampling techniques were followed to recruit 344 Latinas age 41 years and older from predominantly Latino neighborhoods in Denver, Colorado.

Main Outcome Measures—Latinas' adherence to mammography screening recommendations by the American Cancer Society (Smith et al., 2003).

Results—Characteristics that were significantly associated with mammography adherence were age, Pap smear adherence, physician's breast examination instructions and physician's mammography recommendations.

Conclusion—The study provides evidence that the BC screening disparities that significantly affect Latinas can be addressed by increasing physician's involvement through BC screening instruction and referral.

Keywords

cancer control; health disparities; social determinants; Hispanic

Breast cancer (BC) is the most frequent solid tumor among women in the United States, constituting the second-leading cause of cancer death among non-Hispanic white women and the leading cause of cancer death among Latina/Hispanic women (American Cancer Society, ACS, 2009a). Disparities in mortality can be attributed to the detection of BC at an advanced stage among Latinas, due primarily to lower frequency of and longer intervals between mammograms among these women (ACS, 2009; Wells & Roetzheim, 2007). However, assessing how adherent Latinas and other women are to BC screening guidelines

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has been controversial because guidelines have changed over time and various organizations have made somewhat different recommendations (e.g., Smith et al., 2003; Humphrey et al., 2002; Woolf, 1992). Primarily, there has been a lack of consensus regarding the intervals and minimal age for routine mammography screening for women at average risk.

Most recently, the U.S. Preventive Services Task Force (2009) recommended against routine screening mammography in women aged 40 to 49 years and moved to recommend biennial screening mammography for women starting at 50 years of age. Instead, the National Cancer Institute (NCI, 2009) maintains its recommendations that women age 40 and older engage in mammography screening every 1 to 2 years. The American Cancer Society (ACS, 2009b) recommends annual mammography for women 40 years of age and older but it recognizes that mortality reductions occur at screening intervals of 12 and 24 months (Smith et al., 2003). Thus, mammography screening adherence is dependent on the guidelines used to measure BC screening behaviors.

Latinas' Mammography Screening Adherence

Across the various guidelines used, the literature consistently suggests that Latinas compared to non-Latina white women tend to be disadvantaged by significant lower mammography screening rates (e.g., 47% vs. 56%, Abraido-Lanza, Chao, & Gammon, 2004; 66% vs. 74%, Goel et al., 2003). A number of factors have been associated with Latinas' low mammography adherence. The most prominent socioeconomic factors include lower levels of education and income (Brown, Consedine, & Magai, 2006; Magai, et al., 2004) and lack of health insurance (Abraido-Lanza et al., 2004; Aldridge, Daniels, & Jukic, 2006; Coughlin & Uhler, 2002; Wu, Black, & Markides, 2001). Demographic factors associated with lower mammography screening among Latinas tend to be older age and not being married (Borrayo et al., 2009a; Brown et al., 2006; Coughlin & Uhler, 2002). In addition, a growing body of literature has examined the role of certain socio-cultural factors. More specifically, the factors found to deter Latinas' screening behaviors include traditional norms about modesty, fatalistic attitudes about BC, and lower acculturation to the mainstream U.S. culture (Borrayo et al., 2009a; Borrayo et al., 2009b; Abraido et al., 2005). However, the literature is still limited with regard to the role of socio-cultural factors and Latinas' BC screening behaviors.

Instead, there is cumulative evidence that a physician's recommendation to obtain a mammogram is among the most important determinants of Latinas' mammography utilization (Aldridge et al., 2006; Coughlin & Uhler, 2002; Magai et al., 2004; Mandelblatt, Yabroff, & Kerner, 1999). However, a majority of Latinas' underutilize BC screening procedures because they lack active referrals to these procedures that are typically obtained during regular visits to health care providers (Coughlin, Uhler, Richards, & Wilson, 2003). For example, studies have documented a dramatic improvement in the proportion of Latinas who obtained a mammogram after their doctor has recommended this screening procedure to them (Zapka et al., 1993). Physicians who regularly see Latina patients may be more likely to address preventive healthcare issues than those who focus on acute issues presented by transient patients (Aldridge et al., 2006), perhaps such patients lack the income and health coverage to access the health care system regularly (O'Malley et al., 2001; Qureshi, Thacker, Litaker, & Kippes, 2000; Selvin & Brett, 2003). Low socioeconomic and lack of health coverage are also significantly associated with immigration status or non-US citizenship. Immigrants have less access to health care than women who are U.S. born or U.S. citizens and this also seems related to Latina immigrants' lack of participation in mammography screenings when compared to their counterparts (Borrayo & Guarnaccia, 2000; DeAlba, Hubbell, McMullin, Sweningson, & Saitz, 2005; Echeverria & Carrasquillo, 2006; Fernandez, Tortolero-Luna, & Gold, 1998; Goel et al., 2003).

Although Latina immigrants differ from U.S. born Latinas in their BC screening behaviors, the evidence is unclear on whether place of birth (Latin America vs. United States) primarily explains such differences or if these are better explained by women's socio-demographic characteristics and by their physician's recommendation for these procedures. To clarify this question, the current study examined whether physician's involvement (instruction on breast examination and mammography recommendations) predicted Latinas' adherence to the ACS mammography screening guidelines (Smith et al., 2003), above and beyond these women's socio-demographic characteristics, place of birth, years living in the United States, and other cancer screening procedures.

Methods

Participants

A cross-sectional sample of Latinas was obtained from predominantly Latino neighborhoods in Denver, Colorado, in 2006. Participants were recruited at cultural and health events and were offered \$25 in cash as a compensation for their participation. Eligible participants included Spanish-speaking women 40 years of age and older, who self identified as Latina and who had no prior history of breast cancer. Participants were not required nor asked if they had seen a physician to be included in the study. Women with a prior breast cancer history were excluded because this study was interested in the screening behaviors of women who should regularly participate in mammography for screening purposes rather than as a diagnostic or follow up procedure.

Measures

Questionnaires were administered in Spanish by trained bilingual and bicultural research assistants. Prior to data collection, a pilot test was conducted with 20 Latinas who approximated the targeted sample to ensure that the questionnaire was clear and concise. Questionnaire content was then modified based on these Latinas' feedback.

Socio-demographic information—Socio-demographic characteristics included participants self-reported age (years), monthly income (none, less than \$1,000, \$1,001 - \$2,000, \$2,001 - \$3,000, \$3,001- \$4,000, more than \$4,000), educational attainment (0-16+ years), marital status (single, married, divorced, separated, co-habiting, widowed), employment (yes or no), and health insurance coverage (yes or no). Health insurance coverage included private insurance or public insurance coverage (Medicaid, Medicare).

Place of birth and Years Living in the United States—Participants were asked to report their country of birth (Mexico, South America, Central America, USA, other) and how long they had been living in the United States (years).

Breast Cancer Screening—The breast cancer screening behaviors that were assessed were: 1) breast self-exam (BSE) in the past month (no, yes); 2) frequency of BSE in the past year (0, 1-2, 3-5, 6-9, 10-12 times); 3) last Clinical Breast Exam (CBE) that was obtained during the recommended annual Pap Smears (less than 1 year, 1 year, 2 years, 3 years, more than 3 years, or never had one); 4) last mammogram obtained (less than 1 year, 1 year, 2 years, 3 years, more than 3 years ago, or never had a mammogram); and 5) plans to obtain a future mammogram (in 1 to 4 weeks, less than 12 months, 1-2 years, more than 3 years).

Physician Involvement—Information on physician's instruction and referral to mammography screening was obtained from responses to the following questions: 1) has your physician shown you how to examine your breasts? (no=0, yes=1); and 2) has your physician recommended that you obtain a mammogram? (no=0, yes=1).

Data Analyses

Adherence to mammography screening was based on the ACS's mammography screening guidelines (Smith et al., 2003) in place in 2006 when the data were collected. Because mortality reductions have been observed at screening intervals of 12 and 24 months (Smith et al., 2003), a 2-year interval was used for women to be considered adherent. Thus, to be classified as adherent (adherent=1), women should have (1) been 41 years of age or older and (2) had a mammogram within the past 2 years. Participants who reported obtaining a mammogram 3 years ago or longer or never obtaining one were placed in the non-adherent category (non-adherent=0). Analogous to mammography adherence, using the ACS screening guidelines (Smith et al., 2003) a binary variable was also used to characterize Pap Smear adherence (CBE proxy). Women having had a Pap Smear within 3 years prior to the study were considered adherent with the guidelines (adherent=1). Participants who reported never having obtained a Pap exam were placed in the non-adherent category (non-adherent=0).

Descriptive analyses such as means and frequencies were conducted to describe the characteristics of the study sample. Chi-square tests were performed to assess differences in socio-demographic characteristics and prevalence of BC screening behaviors by physician's recommendation for a mammogram. Pearson's Product moment correlations were utilized to examine the relationship among socio-demographic characteristics, place of birth, years living in the U.S., BC screening behaviors and physician instruction and recommendation variables. These correlations were examined to assess if multicollinearity among variables was of concern (results not shown). Interrelationships among the variables were found to be modest and thus we proceeded to include them in the regression modeling. Using logistic regression, the cumulative effect of each category of variables on mammography screening adherence (adherent vs. non-adherent) was assessed through four models. The first included socio-demographic characteristics (Model 1), the second included place of birth and years living in the U.S. (Model 2), and the third included CBE (Model 3). In the last model, socio-demographic characteristics, place of birth, years living in the U.S., and CBE were entered together (Model 4) to assess if physician involvement was associated with mammography screening independent of its association with the other variables.

Results

As shown in Table 1, participants ranged in age from 41 to 82 years old ($M = 51.7$, $SD = 8.7$). Of the 344 participants, only 21% ($n = 72$ women) reported being U.S. born and 79% ($n = 272$) reported being immigrants from Latin America, with the majority being born in Mexico (89%). U.S. born Latinas were significantly older ($M = 54.6$, $SD = 9.4$) than immigrant Latinas ($M = 50.9$, $SD = 8.4$). As expected, U.S. born Latinas had lived longer in the U.S. ($M = 53.2$, $SD = 12.0$) than immigrant Latinas ($M = 13.8$, $SD = 11.8$). Compared to U.S. born Latinas, immigrant Latinas were significantly more likely to report lower annual household incomes, lower educational attainment, obtaining their education in Latin America, unemployment, and no health insurance coverage.

Table 2 presents findings for BC screening behaviors based on whether Latinas' physicians did or did not recommend a mammogram to them. Women whose physician had recommended a mammogram were significantly more likely to have been instructed on breast examination and to have engaged in all BC screening behaviors (BSE in the last month, frequency of BSE in the past year, last CBE obtained, last mammogram obtained and plans to obtain one in the near future) than women whose physician had not recommended a mammogram. Furthermore, zero-order correlations (data not presented) showed that the likelihood of physician's mammography recommendations was significantly ($p = .001$) related not only to mammography adherence but also to most of the participants' socio-

demographic characteristics and to their place of birth and years living in the United States. Consequently, we tested whether the relationship between physicians' involvement and mammography screening adherence persisted after controlling for its association with these other variables.

Table 3 displays the logistic regression modeling results. The outcome that was predicted was the probability of having had a mammogram within the last 2 years (adherence) or of having had one within 3 or more years (non-adherence). When socio-demographic variables were entered (Model 1), none were predictors of the outcome. Similarly, when place of birth and years living in the U.S. were added (Model 2), these variables were also not related to mammography adherence. However, in the second model, age emerged as a significant predictor, indicating that older women were 1.04 times more likely than younger women to adhere to mammography guidelines. Next, Pap Smear adherence (CBE proxy) was added and it was associated to mammography adherence. More specifically, the probability of having had a mammogram within the last 2 years was 6.6 times higher among women who also reported a Pap Smear within the previous 3 years than women who have had a Pap Smear longer than 3 years.

Finally, when physician instructions on breast examination and physician recommendation for a mammogram were added (Model 4), both were found to be significantly related to mammography adherence. In other words, Latinas who had a physician instruct them on how to examine their breast were 3.4 times more likely to report mammography adherence than women who did not have such instruction. Further, Latinas who had their physician recommend a mammogram to them were 5.1 times more likely to report mammography adherence than women who did not receive mammography recommendations. Therefore, the effect of physician's mammography recommendations and physician's breast examination instructions remained after the effects of women's socio-demographic characteristics, place of birth, number of years living in the U.S. and Pap exam adherence had been accounted for in the final model.

Discussion

In this study, we investigated the effects of physicians' involvement (instruction on breast examination and mammography recommendations) on Latinas' adherence to mammography screening (ACS, 2003), after accounting for the effects of other variables that have been found in the literature to be associated with mammography adherence. Logistic regression analyses revealed that physician involvement significantly predicted mammography adherence in spite of the influence of other variables. These results are consistent with other studies that have found that medical doctors seem to greatly influence Latinas' BC screening behaviors (Aldridge et al., 2006; Coughlin & Uhler, 2002; Magai et al., 2004; Mandelblatt et al., 1999).

While Latinas are more likely to adhere to recent mammography if their physicians instruct them on breast examination and recommends that they obtain a mammogram, many medically underserved Latinas do not see a physician regularly. Irregular or sporadic visits to primary care physicians tend to be related to Latinas' lack of access to the health care system in the United States (Coughlin et al., 2003; O'Malley et al., 2001; Qureshi et al., 2000; Selvin & Brett, 2003). Having medical insurance is one of the most salient factors in accessing health care in this country (U.S. Department of Health and Human Services, DHHS, 2003; U.S. DHHS, 2000). In fact, when health insurance status was considered in isolation, Latinas who had some form of health insurance were more likely to be adherent with mammography screening, suggesting that these women had access to preventive health services. Health insurance lost its significant effect when the association of all of the

variables with mammography adherence was considered, but physician's involvement remained a significant factor.

The reason why some Latinas in this sample received a recommendation to obtain a mammogram and others did not receive such a recommendation from their physician is unknown. In the literature, physicians have reported not recommending BC screening procedures such as mammography because of concerns about health care access barriers such as costs or about patient factors such as lack of compliance or psychological distress, among others (Bakemeier, Krebs, Murphy, Shen, & Ryals, 1995; Grady, Lemkau, Lee, & Caddell, 1997; Nutting, et al., 2001). While BC screening procedures are costly, particularly if women do not have health insurance, there is a public health movement to provide costly procedures such as mammography screenings at low cost or free of charge for medically underserved women (Center for Disease Control, 2009). Thus, physicians should actively refer women to these programs as they instruct women on breast examinations and recommend women obtain a regular mammogram according to existent BC screening guidelines.

Women are likely to adhere to their physicians' BC screening recommendations if they receive information about screening procedures that is tailored to a woman's BC beliefs and concerns about the disease and the screening procedures (Simonian, et al., 2004; Skinner, Stretcher, & Hospers, 1994). Among ethnic minority women such as Latinas, their health care providers are likely to be powerful motivators to engage in BC preventive behaviors, especially if they perceive their providers to adhere to cultural norms such as being respectful (*respeto*) and personable (*personalismo*) (Borrayo, Buki, & Feigal, 2005). When Latinas witness culturally-congruent behaviors, this instills trust (*confianza*) in their providers and women seem more likely to follow-up with their screening recommendations (Borrayo et al., 2009b).

Limitations and Contributions

There are a few caveats to consider in the interpretation of this study's results. Consider that women were not selected at random but instead the sample was one of convenience that included participants that were Spanish-speaking only and primarily of Mexican descent. Self-selection bias limits the ability to generalize findings to other U.S. Latinas in this population such as English-speaking only and Latinas of other Hispanic descent. In addition, because the majority of women were born outside of the U.S., having a very homogenous sample could have affected the results. For example, the number of years living in the U.S. did not predict screening and this is probably due to the nature of the homogeneous population given that this variable has been shown to be a predictor in other studies. Furthermore, this study compared only uninsured and insured women, however, future research should compare whether Latinas' mammography adherence differs by type of insurance coverage (i.e., private versus public insurance e.g., Medicare or Medicaid). This will then provide additional information on whether type of insurance coverage influences mammography adherence and will allow comparison to other studies that have examined insurance coverage in a similar manner.

Another limitation is that the outcome variable data came from self-reported behaviors rather than from more observable measures such as medical records, which might be more reliable (Fernandez et al., 1998). Similarly, physician's involvement (instruction on breast examination and mammography recommendations) was ascertained from participants' reports regarding their physician's behavior. Future research could also rely on records that assess whether participants received breast exam instructions and mammography recommendations from their health care providers during their last medical visit, as these may be a more proximal and accurate measure of physicians' involvement. Furthermore, it

may be plausible that lack of access to care (e.g., no primary care physician) may have influenced results such that women may have not had a physician who could provide instruction or recommend a mammogram.

Last, it should be noted as an additional limitation that the measures of mammography adherence potentially reflect broad trends in participants' mammography screening behaviors. We could be excluding or including women who have been adherent or non-adherent because we are not adjusting for women's age or accounting for whether women received mammography recommendations from their physicians that were consistent with the ACS' (2003) screening guidelines. Given that mammography guidelines have changed over time and that organizations vary on their age and interval guidelines, assessing what constitutes women's adherence to BC screening recommendations is still problematic, making comparison of findings across the literature also difficult.

In spite of the study limitations, the findings provide evidence that the BC screening disparities that continue to affect Latinas so profoundly are less dependent on these women's socio-demographic characteristics, years living in the U.S., and place of birth or immigrant status, but more on their physician's involvement through active BC screening instruction and referral. Access to a physician, however, might be difficult for medically underserved Latinas who do not have health insurance coverage or adequate resources to pay for medical care services (Echeverria & Carrasquillo, 2006). While there is a public health movement to provide low cost or free of charge mammography screenings, there is a need to also increase access for the medically underserved to affordable primary health care (U. S. DHHS, 2008). Attending regular visits to primary care physicians increases the likelihood that a physician can address preventive healthcare issues and make appropriate referrals to BC screening procedures that can potentially be life saving.

References

- Abraido-Lanza AF, Chao MT, Gammon MD. Breast and cervical cancer screening among Latinas and non-Latina whites. *American Journal of Public Health*. 2004; 94:1393–1398. [PubMed: 15284049]
- Abraido-Lanza AF, Chao MT, Gates CY. Acculturation and Cancer screening among Latinas: Results from the National Health Interview Survey. *Annals of Behavioral Medicine*. 2005; 29(1):22–28. [PubMed: 15677297]
- Aldridge ML, Daniels JL, Jukic AM. Mammograms and Healthcare Access Among US Hispanic and Non-Hispanic Women 40 Years and Older. *Family & Community Health*. 2006; 29(2):80. [PubMed: 16552286]
- American Cancer Society. *Cancer Facts and Figures for Hispanics/Latinos: 2009-2011*. Atlanta, GA: American Cancer Society; 2009a.
- American Cancer Society. *Cancer Facts & Figures 2009*. Atlanta, GA: American Cancer Society; 2009b.
- Bakemeier RF, Krebs LU, Murphy JR, Shen Z, Ryals T. Attitudes of Colorado health professionals toward breast and cervical cancer screening in Hispanic women. *Journal of the National Cancer Institute Monographs*. 1995; 18:95–100. [PubMed: 8562228]
- Borrayo E, Jenkins SR. Feeling Indecent: Breast cancer screening resistance of Mexican-descent women. *Journal of Health Psychology*. 2001b; 6(5):537–550.
- Borrayo EA, Buki LP, Feigal BM. Breast Cancer detection among older Latinas: Is it worth the risk? *Qualitative Health Research*. 2005; 15(9):1244–1263. [PubMed: 16204403]
- Borrayo EA, Gonzalez P, Swaim R, Marcus A, Flores E, Espinoza P. The Latina Breast Cancer Screening Scale: Beliefs about breast cancer and screening. *Journal of Health Psychology*. 2009b; 14(7):944–955. [PubMed: 19786521]
- Borrayo EA, Guarnaccia CA. Differences in Mexican-born and US-born women of Mexican descent regarding factors related to breast cancer screening behaviors. *Health Care For Women International*. 2000; 21(7):599–613. [PubMed: 11813768]

- Borrayo EA, Hines L, Byers T, Risendal B, Slattery ML, Sweeney C, et al. Characteristics associated with mammography screening among both Hispanic and non-Hispanic White women. *Journal of Women's Health*. 2009a; 18(10):1585–1594.
- Brown WM, Consedine NS, Magai C. Time spent in the United States and Breast Cancer screening behaviors among ethnically diverse immigrant women: Evidence for Acculturation? *Journal of Immigrant Health*. 2006; 8:347–358.
- Carrasquillo O, Carrasquillo AI, Shea S. Health insurance coverage of Immigrants living in the United States: Differences by citizenship status and country of origin. *American Journal of Public Health*. 2000; 90(6):917–923. [PubMed: 10846509]
- Center for Disease Control. National Breast and Cervical Cancer Early Detection Program: FACTS. Atlanta: 2009. Retrived November 30, 2009, from http://www.cdc.gov/cancer/nbccedp/pdf/0809_nbccedp_fs.pdf.
- Coughlin SS, Uhler RJ. Breast and Cervical Cancer Screening Practices among Hispanic Women in the United States and Puerto Rico, 1998–1999. *Preventive Medicine*. 2002; 34(2):242–251. [PubMed: 11817921]
- Coughlin SS, Uhler RJ, Richards T, Wilson K. Breast and cervical cancer screening practices among Hispanic and non-Hispanic women residing near the United States-Mexico border, 1999–2000. *Family and Community Medicine*. 2003; 26(2):130–139.
- DeAlba I, Hubbell AF, McMullin JM, Sweningson JS, Saitz R. Impact of U.S. citizenship status on cancer screening among immigrant women. *Journal of General Internal Medicine*. 2005; 20:290–296. [PubMed: 15836535]
- Echeverria SE, Carrasquillo O. The roles of citizenship status, acculturation, and health insurance in breast and cervical cancer screening among immigrant women. *Medical Care*. 2006; 44(8):788–792. [PubMed: 16862042]
- Fernandez ME, Tortolero-Luna G, Gold RS. Mammography and Pap test screening among low-income foreign born Hispanic women in the USA. *Cad Saude Publica*. 1998; 14(Sup.3):133–147. [PubMed: 9819472]
- Goel MS, Wee CC, McCarthy EP, Davis RB, Ngo-Metzger Q, Phillips RS. Racial and ethnic disparities in cancer screening: The importance of foreign birth as a barrier to care. *Journal of General Internal Medicine*. 2003; 18:1028–1035. [PubMed: 14687262]
- Grady KE, Lemkau JP, Lee NR, Caddell C. Enhancing mammography referral in primary care. *Preventive Medicine*. 1997; 26:791–800. [PubMed: 9388790]
- Humphrey LL, Helfand M, Chan BK, et al. Breast cancer screening: A summary of the evidence for the U.S. Preventive Services Task Force. *Annals of Internal Medicine*. 2002; 137:347–360. [PubMed: 12204020]
- Jang M, Lee E, Woo K. Income, language, and citizenship status: Factors affecting the health care access and utilization of Chinese Americans. *Health and Social Work*. 1998; 23:136–145. [PubMed: 9598396]
- Kapp JM, LeMaster JW, Zweig SC, Mehr DR. Physician recommendations for mammography in women aged 70 and older. *Journal of American Geriatric Society*. 2008; 56:2100–2106.
- Magai C, Consedine NS, Conway F, Neugut A, Culver C. Diversity Matters: Unique populations of women and breast cancer screening. *Cancer*. 2004; 100(11):2300–2307. [PubMed: 15160332]
- Mandelblatt JS, Yabroff KR, Kerner JF. Equitable access to cancer services: a review of barriers to quality care. *Cancer*. 1999; 86:2378–2390. [PubMed: 10590381]
- National Cancer Institute. National Cancer Institute Fact Sheet: Mammograms. 2009. Retrieved June 20, 2010, from <http://www.cancer.gov/cancertopics/factsheet/Detection/mammograms>
- Nutting PA, Baier M, Werner JJ, Cutter G, Conry C, Stewart L. Competing demands in the office visit: What influences mammography recommendations? *Journal of the American Board of Family Practice*. 2001; (14):352–361. [PubMed: 11572540]
- O'Malley MS, Earp JL, Hawley ST, Schell MJ, Mathews HF, Mitchell J. The association of race/ethnicity, socioeconomic status, and physician recommendation for mammography: Who gets the message about breast cancer screening? *American Journal of Public Health*. 2001; 91(1):49–54. [PubMed: 11189825]

- Qureshi M, Thacker HL, Litaker DG, Kippes C. Differences in breast cancer screening rates: An issue of ethnicity and socioeconomic? *Journal of Women's Health*. 2000; 9(9):1025–1031.
- Selvin E, Brett KM. Breast and cervical cancer screening: Sociodemographic predictors among White, Black, and Hispanic women. *American Journal of Public Health*. 2003; 93(4):618–623.
- Smith RA, Saslow D, Sawyer KA, Burke W, Costanza ME, Evans WP, et al. American Cancer Society guidelines for breast cancer screening: update 2003. *CA: A Cancer Journal for Clinicians*. 2003; 53:141–169. [PubMed: 12809408]
- Simonian K, Brown SE, Sanders DB, Kidd CY, Murillo VE, Garcia R, et al. Promoting Breast Cancer Screening to Women of Color. *Nurse Practitioner, The*. 2004; 29(3):45.
- Skinner CS, Stretcher VJ, Hospers HA. Physicians' recommendations for mammography: do tailored messages make a difference? *American Journal of Public Health*. 1994; 84:43–49. [PubMed: 8279610]
- U.S. Preventive Services Task Force. Screening for breast cancer: U.S. Preventive Services Task Force Recommendation Statement. *Annals of Internal Medicine*. 2009; 151:716–726. [PubMed: 19920272]
- US Department of Health and Human Services. National healthcare disparities report. Rockville MD: Agency for Healthcare Research and Quality; 2003.
- US Department of Health and Human Services. Health Centers: American's Primary Care Safety Net, Reflections on Success, 2002-2007. Rockville, MD: Health Resources and Services Administration, bureau of Primary Health Care; 2008.
- US Department of Health and Human Services. Screening for Breast Cancer. 2009. Retrived November 30, 2009, from <http://www.ahrqu.gov/clinic/USpstf/uspsbrca.htm#summary>
- US Department of Health and Human Services (US DHHS). Healthy people 2010: Understanding and improving health. Washington, DC: US Government Printing Office; 2000.
- Wells KJ, Roetzheim R. Health disparities in receipt of screening mammography in Latinas: A critical review of recent literature. *Cancer Control*. 2007; 14(4):369–379. [PubMed: 17914337]
- Wolf SH. United States Preventive Services Task Force recommendations on breast cancer screening. *Cancer*. 1992; 69:1913–1918. [PubMed: 1544091]
- Wu ZH, Black SA, Markides KS. Prevalence and associated factors of cancer screening: why are so many older Mexican American women never screened? *Preventive Medicine*. 2001; 33:268–273. [PubMed: 11570830]
- Zapka J, Costanza M, Harris D, Hosmer D, Stoddard A, Barth R, et al. Impact of a breast cancer screening community intervention. *Preventive Medicine*. 1993; 22:34–53. [PubMed: 8475011]

Table 1

Socio-demographic Characteristics for all Participants and by Place of Birth

Socio-Demographic Characteristics	All Latinas (N =344)	U.S. born	Non U.S. born	p
		n = 72	n = 272	
N (%)				
Place of origin				
Mexico	241 (70)	-	241(89)	-
South America	12 (4)	-	12 (4)	
Central America	15 (4)	-	15 (6)	
USA	72 (21)	-	-	
Other	4 (1)		4 (2)	
Marital Status				
Single	28 (8)	9 (13)	19 (7)	.171
Married	184 (54)	38 (53)	146 (54)	
Divorced	37 (11)	12 (17)	25 (9)	
Separated	46 (14)	6 (8)	40 (15)	
Co-habiting	22 (7)	3 (4)	19 (7)	
Widowed	24 (7)	4 (6)	20 (7)	
Monthly Income				
None	10 (3)	1 (1)	9 (3)	.000
Less than \$1,000	133 (39)	19 (26)	114 (42)	
\$1,001-\$2,000	115 (33)	10 (14)	105 (39)	
\$2,001-\$3,000	35 (10)	11 (15)	24 (9)	
\$3,001-\$ 4,000	20 (6)	14 (19)	6 (2)	
Over \$4,000	31 (9)	17 (24)	14 (5)	
Education Level				
Less than High School	208 (60)	14 (19)	194 (71)	.000
High school (12 years+)	136 (40)	58 (81)	78 (29)	
Obtained Education				
Latino America	246 (74)	3 (4)	243 (93)	.000
United States	87 (26)	69 (96)	18 (7)	
Employed				
Yes	165 (48)	47 (65)	118 (43)	.001
No	179 (52)	25 (35)	154 (57)	
Insurance Coverage				
Yes	124 (36)	56 (78)	68 (25)	.000
No	220 (64)	16 (22)	204 (75)	
	Mean (SD)	Mean (SD)	Mean (SD)	p
Mean age	51.7 (8.7)	54.6 (9.4)	50.9 (8.4)	.003
Years in the U.S.	22.1 (19.9)	53.2 (12.0)	13.8 (11.8)	.000

Note. Numbers in the group categories do not add to the total number of participants because of missing data for a few variables.

Table 2

Breast Cancer Screening by Physician's Mammography Recommendations

Breast Cancer Screening	Total (N = 344) N (%)	Physician Recommended n = 269		Physician did not recommend n =75	p value
		n (%)			
BSE in past month					
Yes	184 (54)	154 (57)	30 (40)		.008
No	160 (46)	115 (43)	45 (60)		
BSEs in past year					
0	44 (13)	23 (9)	21 (28)		.000
1-2	117 (35)	92 (35)	25 (33)		
3-5	61 (18)	53 (20)	8 (11)		
6-9	57 (17)	52 (20)	5 (7)		
10-12	60 (18)	44 (17)	16 (21)		
Breast Exam Instruction					
Yes	296 (86)	246 (91)	50 (67)		.000
No	48 (14)	23 (9)	25 (33)		
Clinical Breast Exam					
< 1 year	123 (36)	109 (41)	14 (19)		.000
Last year	97 (28)	73 (27)	24 (32)		
2 Years	58 (17)	41 (15)	17 (23)		
3 Years	19 (6)	15 (6)	4 (5)		
> 3 years	39 (11)	30 (11)	9 (12)		
Never	8 (2)	1 (1)	7 (9)		
Last mammography					
< 1 year	105 (31)	98 (36)	7 (9)		.000
Last year	91 (27)	77 (29)	14 (19)		
2 Years	49 (14)	42 (16)	7 (9)		
3 Years	17 (5)	11 (4)	6 (8)		
> 3 years	21 (6)	16 (6)	5 (7)		
Never	61 (18)	25 (9)	36 (48)		
Mammography Plans					
1-4 weeks	100 (29)	80 (30)	20 (27)		.001
Less than 12 months	144 (42)	111 (41)	33 (45)		
1-2 years	75 (22)	66 (25)	9 (12)		
3+ years	23 (7)	11 (4)	12 (16)		

Note. Numbers in the group categories do not add to the total number of participants because of missing data for a few variables; BSE = Breast Self-Exam.

Table 3
Predictors of mammography screening adherence as entered in four separate logistic regression models

Predictors	Model 1			Model 2			Model 3			Model 4		
	Exp (B)	95% CI	p	Exp (B)	95% CI	p	Exp (B)	95% CI	p	Exp (B)	95% CI	p
Age (years)	1.03	(.99-1.1)	.056	1.04	(1.0-1.1)	.048	1.05	(1.0-1.1)	.007	1.05	(1.0-1.1)	.024
Employment (no =0, yes=1)	0.880	(.51, 1.5)	.644	0.863	(.50-1.5)	.596	0.817	(.46-1.4)	.489	0.728	(.39-1.4)	.328
Insurance (no =0, yes=1)	1.67	(.89, 3.1)	.108	1.69	(.86-3.3)	.131	2.06	(.99-4.3)	.052	1.94	(.87-4.3)	.107
Monthly income (dollars)	1.20	(.93,1.6)	.167	1.24	(.95-1.6)	.112	1.18	(.89-1.6)	.244	1.08	(.80-1.5)	.610
Education (years)	1.00	(.93, 1.1)	.997	1.01	(.95-1.1)	.715	1.01	(.94-1.1)	.779	1.00	(.93-1.1)	.916
Marital status	1.26	(.77, 2.1)	.363	1.28	(.77-2.1)	.338	1.34	(.79-2.3)	.279	1.48	(.83-2.6)	.184
Place of Birth (non-U.S.=0, U.S.=1)				0.435	(.15-1.3)	.137	0.500	(.15-1.6)	.246	0.726	(.20-2.7)	.629
Years living in U.S.				1.01	(.99-1.0)	.396	1.01	(.98-1.0)	.492	1.00	(.98-1.0)	.885
Pap Smear adherence (CBE proxy)							6.59	(3.2-13.7)	.000	6.30	(2.8-14.1)	.000
Physician Instruction										3.44	(1.5-7.7)	.003
Physician Recommendation										5.09	(2.6-9.8)	.000

Note. N=344. Mammography screening adherence (1=adherence, 0=non-adherence). Exp (B): change in odds when a given independent variable increases by one unit. CI=confidence interval.