Breast cancer screening in regional Hispanic populations

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Abstract

Although Hispanics’ use of breast cancer screening services has been investigated, to date there have been no published studies of distinct Hispanic populations in different areas of the country. Using the diverse populations and sites involved in the National Hispanic Leadership Initiative on Cancer ‘En Acción’, this study examines ethno-regional differences in breast cancer screening rates among these groups and explores the correlates of screening participation. Data collected through telephone surveys were analyzed for women 40 years of age and older (n = 2082). After controlling for demographic variables traditionally related to breast cancer screening rates, it was found that ethno-regional differences in breast cancer screening rates clearly persisted. In addition to traditional demographic factors, other variables evidently underlie differences in Hispanics’ utilization of breast cancer screening services. These variables may be cultural and should be investigated in future research. Meanwhile, researchers should not refer to the ‘Hispanic’ population at large without identifying, addressing and clarifying the ethno-regional characteristics of their samples.

Introduction

Hispanic women consistently show lower breast cancer screening rates than non-Hispanic White women, and tend to seek and attain health care services less than other ethnic groups (Fox and Stein, 1991; Stein et al., 1991; Longman et al., 1992; Vernon et al., 1992; Fox and Roetzheim, 1994; Fulton et al., 1995; Hubbell et al., 1995; Ramirez et al., 1995; The National Cancer Institute Cancer Screening Consortium for Underserved Women, 1995; Salazar, 1996). In a study of 1057 women over 35 years of age, Hispanic women both under and over 50 years of age were more likely never to have had a mammogram than were Black and non-Hispanic White women (Fox and Stein, 1991). In addition, non-Hispanic White women who received care through a doctor’s office and even those with no regular source of health care were more likely than Hispanic women to have a mammogram.

Many studies have pointed out the basic reasons for the underutilization of breast cancer screening among Hispanic women (Caplan et al., 1992; Vernon et al., 1992; Saint-Germain and Longman, 1993; Fox and Roetzheim, 1994; Perez-Stable et al., 1994; Chavez et al., 1995). Latinas frequently are poor, lack health insurance, have fewer years...
of formal education and have higher unemployment rates leading to inadequate finances to pay for medical care (Hubbell et al., 1991; Caplan et al., 1992; Vernon et al., 1992; Fox and Roetzheim, 1994; Bakemeier et al., 1995). Although health insurance participation is an important determinant of screening behavior (Suarez, 1994; Longman et al., 1992), low income levels do not entirely explain low participation in screening. Even without financial barriers to cancer screening, Latinos are less likely to utilize cancer screening services than are Anglos (Perez-Stable et al., 1994).

Limited knowledge about cancer-related risk factors and cancer screening procedures, as well as cultural and language barriers, may also keep Latinas from seeking health care or cancer-related services (Caplan et al., 1992; Vernon et al., 1992; Saint-Germain and Longman, 1993; Fox and Roetzheim, 1994; Suarez, 1994; Perez-Stable et al., 1994; Bakemeier et al., 1995; Chavez et al., 1995; Morgan et al., 1995). The inability to speak English is a significant barrier to screening for many Hispanic women (Longman et al., 1992; Suarez and Pulley, 1995). Hispanic women who are more proficient in English or who prefer English rather than Spanish are more likely to have had a mammogram (Suarez, 1994). This may be because English-speaking Hispanic women are more likely to have had a doctor discuss early detection, breast self-examination, clinical breast examination (CBE) and mammograms with them (Stein and Fox, 1990). Educational attainment has also shown a strong positive association with breast cancer screening compliance. The more years of formal education a Hispanic woman has, the more likely she is to have had a mammogram (Perez-Stable et al., 1994; Suarez, 1994; Suarez and Pulley, 1995).

Thus, we know that low income, low education attainment, lack of insurance, inability to speak English, lack of awareness of breast cancer risks and screening methods, acculturation level, and physician referrals all play a role in the lower rates of screening among Hispanics. But among which Hispanics? Past studies often have failed to distinguish the Hispanic group under study. The Hispanic population is, in fact, composed of many groups (e.g. Mexican-American, Puerto Rican and Cuban) with differing histories and levels of factors that influence cancer screening. Although mammography participation rates among some Hispanic groups have been periodically reported, a complete study of distinct Hispanic populations in different parts of the US has not been conducted. In this study, we report the breast cancer screening practices of 2082 Hispanic women of four origin groups from eight regions of the country. The baseline survey data on mammogram participation provide a unique opportunity to examine geographic and cultural differences among these Hispanic population groups and to explore the correlates of screening.

**Methods**

Data for the present study are from the baseline assessment in a multi-site cancer prevention and control demonstration study. Funded by the National Cancer Institute, the National Hispanic Leadership Initiative on Cancer ‘En Acción’ project involves eight locations across the US that focus on four distinct Hispanic populations: Central American, Cuban, Mexican-American and Puerto Rican. Combining national and regional health expertise with grassroots community leadership, this multi-risk cancer research and outreach program has integrated the latest advances in cancer investigation into health policy and practice among a substantial segment of the US Hispanic population. Approval for the project was granted by the Institutional Review Board of the University of Texas Health Science Center at San Antonio.

**Research Sites**

The eight research sites were selected because of their concentrated populations of the four major Hispanic origin groups. Although at each site the Hispanic populations were diverse, concentrations of the following Hispanic groups were found as follows: Central Americans in San Francisco, California; Cubans in Miami, Florida; Mexican-Americans in Brownsville, Houston, Laredo and
Sample selection
At each location, the target area was geographically defined by census tracts and zip codes. Lists of working residential telephone numbers within these areas were randomly sampled by computer. Up to 12 attempts per telephone number were made to identify and interview eligible subjects. Within each site, stratified quota sampling was employed to obtain 300 Hispanic subjects (without regard to origin) for each of four sex–age groups: males and females, below age 40 and age 40 or older. Interviews continued until each cell of the stratified sampling matrix was filled or the pool of Hispanics within target age–gender groups was exhausted. For example, in San Francisco, only 229 interviews were completed among Hispanic women age 40 and older because of the diminished pool of eligible subjects in the target area.

Instrument development
The telephone survey instrument was designed using previously administered questions from the Health Interview Survey (US Bureau of the Census, 1992), Behavioral Risk Factor Surveillance Survey (Centers for Disease Control and Prevention, 1998) and our previous research (Ramirez and McAlister, 1988). A national panel of Hispanic experts in behavioral sciences and cancer prevention also reviewed the questionnaire. The panel made recommendations regarding appropriate items related to ethnic demographics; cancer screening practices; cancer knowledge; attitudes and beliefs; cultural beliefs and practices; risk behaviors; and other factors that affect Hispanics’ participation in cancer prevention. All items were subsequently evaluated for population acceptability and sensitivity. The survey instrument was pre-tested in San Antonio and San Francisco, using a separate sample of women similar to study participants. Minor changes were made prior to implementation. The questionnaire was translated from English to Spanish and back-translated using well-established methods to ensure accuracy and use of culturally appropriate words.

Implementation
The Spanish language survey took an average of 27 min to administer and the English version took an average of 24 min. Interviews were conducted from October 1993 to July 1994. Overall, 4732 women and 4170 men age 18 and older completed interviews. The response rate was calculated by dividing the number of completed interviews by the sum of completed interviews plus refusals. For the eight cities sampled, the mean response rate was 83% (range 73–92%).

Research questions and analysis
The present study utilized the sample of women age 40 years and older \( (n = 2383) \). For this analysis of differences among ethno-regional Hispanic groups, the sample was further restricted to members of the predominant ethnic group within each site \( (n = 2082) \). For example, the few subjects who were Central American or Puerto Rican in Miami were excluded and so on at each site.

Data analyses were designed to answer three study questions. (1) Are there group and regional differences in breast cancer screening among Hispanic populations? (2) Do presumed correlates derived from the research literature predict breast cancer screening among all of the Hispanic women sampled? (3) After controlling for predictive fac-
Table I. Demographic characteristics (%) for samples of Hispanic women age ≥40 (N = 2082)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Central Americans San Francisco (n = 121)</th>
<th>Cubans Miami (n = 266)</th>
<th>Mexican-Americans Brownsville (n = 299)</th>
<th>Houston (n = 277)</th>
<th>Laredo (n = 298)</th>
<th>San Antonio (n = 302)</th>
<th>San Diego (n = 295)</th>
<th>Puerto Ricans Brooklyn (n = 224)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40–49</td>
<td>23.1</td>
<td>12.4</td>
<td>32.1</td>
<td>43.3</td>
<td>32.2</td>
<td>16.6</td>
<td>37.6</td>
<td>36.2</td>
</tr>
<tr>
<td>50–64</td>
<td>38.0</td>
<td>27.8</td>
<td>36.1</td>
<td>30.0</td>
<td>31.2</td>
<td>27.5</td>
<td>38.0</td>
<td>40.2</td>
</tr>
<tr>
<td>≥65</td>
<td>38.8</td>
<td>59.8</td>
<td>31.8</td>
<td>26.7</td>
<td>36.6</td>
<td>56.0</td>
<td>24.4</td>
<td>23.7</td>
</tr>
<tr>
<td>HS graduate</td>
<td>33.1</td>
<td>48.9</td>
<td>20.3</td>
<td>20.6</td>
<td>25.2</td>
<td>28.9</td>
<td>28.8</td>
<td>22.9</td>
</tr>
<tr>
<td>Income &gt;$10 000</td>
<td>50.6</td>
<td>43.5</td>
<td>43.6</td>
<td>53.2</td>
<td>45.4</td>
<td>47.0</td>
<td>53.9</td>
<td>33.9</td>
</tr>
<tr>
<td>Had health care plan</td>
<td>70.2</td>
<td>80.8</td>
<td>48.5</td>
<td>52.0</td>
<td>57.0</td>
<td>68.5</td>
<td>66.9</td>
<td>83.9</td>
</tr>
<tr>
<td>English use</td>
<td>15.7</td>
<td>9.8</td>
<td>22.7</td>
<td>34.7</td>
<td>29.5</td>
<td>55.8</td>
<td>28.5</td>
<td>36.6</td>
</tr>
</tbody>
</table>


tors, do regional and group differences in breast cancer screening persist? Dependent variables for this study were (1) ever had CBE, (2) CBE within past 2 years, (3) ever had mammography and (4) had mammography in past 2 years. Selected correlates derived from the literature were examined by ethno-regional group, and included age (40–49, 50–64, 65+ years), education (high school graduation or above), household income (above $10 000), having a health care plan (yes/no) and language preference (English/Spanish). To evaluate variation in screening, percentages of women who reported having had a CBE or a mammogram (ever and within the previous 2 years) and 95% confidence intervals were calculated by ethno-regional group. A \( \chi^2 \)-test was used to test for overall ethno-regional differences.

Logistic regression was used to identify the most significant correlates of screening over all Hispanic women. These correlates were then used in a logistic regression model to determine whether differences among individual ethno-regional groups in CBE and mammography use could be eliminated by controlling for predictive factors determined from the sample of all Hispanic women. The sample size available for multivariate logistic regression was reduced because 24% of subjects \( (n = 497) \) had unknown income. Despite the reduction in number of subjects, income was included in logistic regression models because it proved to be a significant predictor. An examination of screening rates between those who reported an income and those who did not showed no significant differences in screening rates (for recent mammography 58 versus 56%). Statistical significance was assessed through the Walsh test for dichotomous variables and with likelihood ratio tests for design variables (e.g. age). All analyses were performed using SPSS-PC (version 8.0).

**Results**

As shown in Table I, there were considerable differences in demographic characteristics among the Hispanic groups. Cuban women in Miami and Mexican-American women in San Antonio were older than the rest of the sample, with 59.8 and 56% of women age 65 or above. Mexican-American women in Houston and San Diego, and Puerto Rican women in Brooklyn were the youngest, with over a third less than 50 years of age. Cuban women in Miami were the most educated (48.9% high school graduates), while Mexican-American women in certain regions of Texas were the least educated (20% high school graduates). English use was greatest among Mexican-American women in San Antonio and least among Cuban women in Miami. Having a health care plan was most widely reported on both the East and West Coasts, and least reported in Houston and Brownsville.

Figure 1 presents the percentages of women age 40 and older who reported having ever received a CBE, by major ethnic population and location.
There was significant variation in lifetime and recent CBE by ethno-regional groups ($P < 0.0001$). The proportion of women receiving CBE was lowest among Mexican-Americans in Texas, especially on the Texas–Mexico border and highest among Central Americans in San Francisco. Figure 2 presents percentages of lifetime and recent mammography utilization, by ethnic group and location. As with CBE, Hispanic regional groups exhibited significant variations in lifetime and recent mammography ($P < 0.001$). Mexican-American women on the Texas border had the lowest mammogram use of any group. Central American women in San Francisco, Cuban women in Miami and Puerto Rican women in New York reported the highest use. Mexican-American women in San Diego and in San Antonio were similar in their use of mammography.

Table III shows results for logistic regressions of lifetime CBE, lifetime mammography, and recent CBE and mammography on ethno-regional groups adjusting for age, education, income, health plan and English use. Adjusted odds ratios for each group reflect the relative odds of receiving each exam compared to Central Americans in San Francisco. With adjustment for correlates, significant group differences in lifetime and recent CBE and mammography ($P < 0.001$) remained.

Figure 2 presents percentages of lifetime and recent the only independent variable related to each of the three breast cancer screening behaviors and was most strongly related to mammography receipt ($P < 0.001$). Language preference was related to CBE and mammography ($P < 0.05$) but not to recent mammography. Having a health plan was the only independent variable related to each of the three breast cancer screening behaviors and was most strongly related to mammography receipt ($P < 0.001$). Language preference was related to CBE and mammography ($P < 0.05$) but not to recent mammography.
Fig. 2. Percent lifetime and recent mammogram by region/ethnic group.

Table II. Predictors of breast cancer screening

<table>
<thead>
<tr>
<th></th>
<th>Ever had CBE (n=1577)</th>
<th>Had CBE in past 2 years (n=1577)</th>
<th>Ever had mammography (n=1566)</th>
<th>Had mammography in past 2 years (n=1566)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
<td>OR</td>
<td>95% CI</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40–49</td>
<td>1.00</td>
<td>referent</td>
<td>1.00</td>
<td>referent</td>
</tr>
<tr>
<td>50–64</td>
<td>0.88</td>
<td>0.64–1.21</td>
<td>0.96</td>
<td>0.73–1.25</td>
</tr>
<tr>
<td>65+</td>
<td>0.90</td>
<td>0.62–1.29</td>
<td>0.94</td>
<td>0.70–1.28</td>
</tr>
<tr>
<td>HS graduate</td>
<td>0.88</td>
<td>0.64–1.20</td>
<td>0.94</td>
<td>0.72–1.22</td>
</tr>
<tr>
<td>Income &gt;$10 000</td>
<td>1.35*</td>
<td>1.01–1.80</td>
<td>1.51***</td>
<td>1.19–1.93</td>
</tr>
<tr>
<td>Had health care plan</td>
<td>1.52***</td>
<td>1.14–2.03</td>
<td>1.66***</td>
<td>1.30–2.12</td>
</tr>
<tr>
<td>English use</td>
<td>1.86***</td>
<td>1.35–2.57</td>
<td>1.32*</td>
<td>1.02–1.70</td>
</tr>
</tbody>
</table>

*P < 0.05; **P < 0.01; ***P < 0.001.

In total 497 women (24%) were excluded from this analysis because of unknown income. An additional eight women were excluded from the CBE logistic regression model because of missing information on CBE and other covariates. An additional 19 women were excluded from the mammography model because of missing information on mammogram use and other covariates.
Focusing on the results for recent mammography, all groups were significantly less likely to have had a recent mammogram than Central Americans in San Francisco. As in the univariate analysis, Cubans in Miami remain the second-highest users of recent mammography, even with adjustment for other predictors. Additionally, controlling for age, education, income and health care plan, Mexican-American women in Houston, Brownsville and Laredo were the least likely to have been screened for breast cancer.

**Discussion**

The reasons why ethno-regional differences in screening persisted after controlling for the common predictive factors are not clear and warrant further research. However, these differences reinforce the importance for health researchers not to simply refer to ‘Hispanics’ as a single population or class. Based on our study, large ethno-regional differences in breast cancer screening behaviors exist among Hispanic groups across the country. Recent mammography varied from over 70% among Central American women in San Francisco and Cuban women in Miami to below 50% among Mexican-American women on the Texas border. Although the age structure and health care coverage also differed vastly among these Hispanic groups in different regions, adjusting for these variables did little to change the relative position of these groups with regard to mammography.

More reasonably, the term ‘Hispanic’ should not be used without identifying, addressing and clarifying the ethno-regional characteristics of the research sample. Consequently, any generalization involving these groups under the broad classification of ‘Hispanics’ should be considered carefully, given their clear heterogeneity. Even researchers who have purposefully sampled Hispanics with different ethnic origins have tended to treat them as a single group rather than emphasizing differences among the Hispanic groups, preferring to report on a single ‘Latina model’ as compared with a ‘physician’ or ‘Anglo’ model of beliefs about breast cancer and breast cancer screening (Chavez et al., 1995; Hubbell et al., 1995; Hoffman-Goetz et al., 1998). Differences, as well as similarities, should be taken into consideration when planning health care delivery services for these specific communities. Cancer control specialists seeking to provide breast cancer screening for Hispanic...
women need to recognize the diversity of this population and concentrate efforts where the need is greatest. It should be noted that similar issues undoubtedly apply to other heterogeneous racial/ethnic groups, such as African-Americans from various countries and cultures of origin, Asians and Pacific Islanders, and Native Americans.

This discussion is subject to a number of factors that limit generalization to all Hispanic communities across the country. About 25% of the potential subjects did not provide complete data, the large majority of which regarded household income. As these subjects were excluded from some of the analysis, there may be a bias related to economic status for which we could not control. The data are self-reported, with the inherent possibility of recall bias or error on the part of the subjects. For instance, in six of the eight locations in this study, recent mammography rates ranged from greater than 50% to greater than 80%. These are somewhat higher rates than those reported in other studies of Hispanics, in which 47–59% reported recent mammography (Perez-Stable et al., 1995; Frazier et al., 1996). Similarly, the present study found rates of greater than 70% to almost 90% for CBE as compared with 59–82% in those studies. Our data do not allow us to ascertain whether these differences can be attributed to the tendency toward overestimation common to self-reported data (Hiatt et al., 1995) or if they reflect true differences. The possibility of potential response biases associated with telephone surveys is also present.

In the present study, we focused on ethnically diverse groups that represented major Hispanic populations in their respective locations, i.e. Central American in San Francisco, Cuban in Miami, Mexican-American in Southern California and Texas, and Puerto Rican in New York City. In each location, however, there were other, generally smaller Hispanic groups who were excluded from this analysis. Therefore, it is not possible to conclude whether the results are due specifically to ethnic differences or to differences related to geographic region. Furthermore, the large majority of subjects were Mexican American, with much smaller samples from the other groups. Consequently, we cannot say that the samples in the present study are necessarily representative of their respective Hispanic populations around the country.

Acculturation was measured indirectly by language preference. However, it should be noted that acculturation is more complex than language utilization alone, and its effect on cancer prevention, screening and early detection warrants additional attention. Other variables not measured in this study may be responsible for differences among regions and groups. For instance, one possible reason for underutilization of screening services is poor physician compliance with screening recommendations (Caplan et al., 1992; Vernon et al., 1992; Guerra et al., 1994; Bakemeier et al., 1995; Morgan et al., 1995). Several factors have been identified, including lack of time, cost, forgetfulness, lack of reimbursement to physicians for CBEs, lack of belief in the efficacy of mammograms for older women, perceived patient discomfort and language barriers (Caplan et al., 1992; Guerra et al., 1994; Bakemeier et al., 1995).

Gemson and colleagues found that physicians providing care to predominantly Black and Hispanic populations were less compliant with preventive medicine guidelines than were those practicing with a large number of non-Hispanic patients (Gemson, et al., 1988). It is possible that physicians who see Hispanic women in different parts of the country differ in recommending breast cancer screening. Alternatively, regional Hispanic differences in screening rates may be due to variations in available mammography services across communities. Cancer prevention and screening services may be more available in strong and pervasive economic areas such as California than in the poorer communities of South Texas. Thus, adjusting for individual markers of social economic status may not have accounted for differences in the community social and economic environments.

According to the Healthy People 2000 cancer objectives for mammogram use, 80% of women 40 years and over should have had a mammogram, and 60% of women 50 years and over should have received one within the preceding 2 years. Data
from our study show that only San Francisco (86%) and Miami (80%) met these goals. The prevailing attitude among Hispanic populations of indifference toward prevention behaviors often poses an obstacle to health promotion programs and services aimed at these audiences. In general, Hispanics regard doctors’ offices, clinics and other health care facilities as places to go only when one feels ill or when symptoms are present. Consequently, this can serve as an impediment for health promotion efforts to achieve widespread participation in cancer screening. To eliminate the existing disparities and lessen the burden of the disease in this heterogeneous minority group, there is a great challenge for health care providers, policymakers, researchers and health educators to develop appropriate cancer prevention and control strategies. The present study does not completely elucidate the reasons for variations in Hispanic women’s breast cancer screening practices and more research on these differences is clearly warranted.

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