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## Never Screened: Understanding Breast Cancer Nonadherence in Puerto Rico

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### Abstract

Breast cancer is the most commonly diagnosed cancer and the leading cause of cancer-related death among women in Puerto Rico (PR). The purpose of this study was to identify factors associated with never screened status among a sample of women nonadherent to the 2013 American Cancer Society guidelines. The inclusion criteria for this study were being a woman (1) aged 40 years old and (2) nonadherent to breast cancer screening guidelines. We used baseline data from participants ( $N = 300$ ; aged 40 years old) enrolled in the intervention trial *Cultivando la Salud*, implemented in Canóvanas, Puerto Rico, from 2012 to 2014. We used multivariate logistic regression models to identify factors associated with never screening status, adjusting by sociodemographical variables and psychosocial constructs about mammography (self-efficacy, beliefs about mammography pros [benefits] and cons [disadvantages], and subjective norms) as well as by health care insurance, usual source of care, and Pap test adherence. Among nonadherent women, 18.0% reported never having a mammography. Never screened women were significantly younger than previously screened women (adjusted prevalence odds ratio [aPOR] = 7.32, 95% confidence interval (CI): [2.38, 22.50]) and almost four times as likely to have the governmental health plan (GHP; aPOR = 3.78, 95% CI: [1.15, 12.46]). In addition, never screened women perceived more cons (disadvantages) to mammography than previously screened women (aPOR = 1.81, 95% CI: [1.18, 2.78]). We found that women who were younger, had GHP insurance, and had higher levels of beliefs against mammography were more likely to have never been screened. Results from this study can be used to target never screened women with health education messages addressing perceived cons of mammography. Additionally, women with GHP insurance

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Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical Approval

All the study procedures were approved by The University of Puerto Rico Medical Sciences Campus Institutional Review Board and The University of Texas Health Science Center at Houston Committee for the Protection of Human Subjects prior to the recruitment of the participants.

may experience disparities in health care access and should be targeted with policies that facilitate access to mammography screening.

## Keywords

cancer health disparities; breast cancer; mammography; Puerto Rico; outreach; community engagement; Hispanic Americans

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Breast cancer is the most common malignancy and the leading cause of cancer deaths among women living in Puerto Rico (PR; U.S. Cancer Statistics Working Group, 2019). Mammography screening is associated with a reduction in breast cancer mortality (Oeffinger et al., 2015), yet it continues to be underutilized in PR—although cancer screening estimates in 2016 for the United States were lower than for PR (72.3% [United States] vs. 80.1% [PR]; Centers for Disease Control and Prevention, 2016; U.S. Department of Health and Human Services, 2000); while nonadherent women need messages and targeted interventions to increase breast cancer screening, health promotion approaches that address specific needs of certain subgroups, such as never screened women, may be more effective.

Previous studies have shown that system barriers related to health care coverage or access, such as a lack of referral, a lack of insurance, or a lack of a health provider, may influence screening behavior (Miranda-Diaz et al., 2015; Pagan et al., 2012). While some studies have demonstrated that individual level barriers, such as limited knowledge about breast cancer and mammography and negative beliefs about the procedure, have been associated with never being screened as compared with ever-screened women (Lee-Lin et al., 2015; Sanchez Ayendez et al., 2001; Stoll et al., 2015; Wang et al., 2009), more research is needed to identify specific needs of never screened women and to determine if targeted interventions are needed.

The aim of our study is to identify factors associated with never screened status in a sample of women nonadherent to breast cancer screening according to the 2013 American Cancer Society (ACS) guidelines.

## Method

### Study Design

This is a secondary data analysis from the intervention trial *Cultivando la Salud* (CLS, Cultivating Health) implemented in Canóvanas, PR, from 2012 to 2014 (Colon-Lopez et al., 2017). CLS is a breast and cervical cancer screening promotion program that was originally designed to support low-income Hispanic women older than 50 years living in the United States (Fernández et al., 2005). This intervention was effective in increasing cervical and breast cancer screening rates among Hispanic women living in neighborhoods from the U.S.–Mexico border area (New Mexico and Texas), Central Valley of California, and Hays County and Houston (Texas; Bartholomew et al., 2006; Fernández et al., 2005; Fernández et al., 2009). CLS was adapted for implementation in Canóvanas, PR (Colon-Lopez et al., 2017), recruiting nonadherent women for breast and cervical cancer screening. Trained field data collectors (FDCs) visited all the households from 160 randomly selected census blocks

for recruitment. FDCs recruited a total of 444 women aged 21 years old nonadherent to the aforementioned cancer screening guidelines. Women who did not meet breast cancer screening guidelines from the 2013 ACS guidelines were considered as nonadherent. The 2013 ACS screening guidelines recommends yearly breast cancer screening beginning at age 40 years (Smith et al., 2013). FDCs interviewed the participants face-to-face. Baseline survey assessed sociodemographic factors that could be related to screening. All the study procedures were approved by the institutional ethics committees prior to the recruitment of participants.

The sample size for the analysis of this study was 300 women, which included the following inclusion criteria: (1) aged 40 years old and (2) nonadherent to breast cancer screening. In the analysis, we excluded data from 144 women from the baseline trial who were adherent to breast cancer screening guidelines or were not due for breast cancer screening because they were younger than 40 years. Baseline interview data entry and management was completed using REDCap (Research Electronic Data Capture), a secure web-based application designed to support data capture for research studies (Harris et al., 2009).

## Measures

**Dependent Variable.**—The primary outcome variable for this study is breast cancer screening nonadherence status, which was dichotomized to identify women who (1) were never screened or (2) had been screened in the past but were currently nonadherent to recommended guidelines. We used the responses to the question “Have you ever had a mammography?” Women who answered “no” were classified as “never screened,” while those who answered “yes” and gave the date of their last screening were classified as “previously screened.” It is important to highlight that those women who are categorized as “never screened” implies participants who at the time of the CLS recruitment did not comply with the 2013 ACS screening guidelines and never had a mammogram. Women categorized as “previously screened” could potentially include women who had a mammogram sometime in the past but were nonadherent to the breast cancer screening guidelines followed by our research team.

**Independent Variables.**—Sociodemographical variables (age, education, income, and marital status), health care access (insurance, reported usual source of care), perceived health status, Pap test adherence, breast cancer family history, mammography self-efficacy, and psychosocial constructs such as beliefs about mammography (cons and pros), mammography subjective norms, and perceived barriers for breast cancer screening with screening nonadherence status were included in the analysis. Moreover, we gathered income information by asking study participants their household annual income 12 months prior to recruitment. We coded health care insurance as private, governmental health plan (GHP, and uninsured and calculated reported usual source of care as published elsewhere (Mack et al., 2009). Briefly, usual source of care refers to the doctor’s office or health center where the women goes to receive routine health services or when she is ill (Mack et al., 2009).

Never screened and previously screened participants overdue for screening ( $n = 113$ ; women reporting that their last mammography had been more than 2 years prior to the baseline)

were asked what barrier(s) prevented them from having mammography screening ( $n = 187$ ). Previously screened women who had their last mammography less than 2 years prior to the baseline were not asked this question. This was an open-ended question, and participants could indicate more than one barrier. For analysis purposes, research team categorized participants' responses. Our categorization is based on the barriers for breast cancer screening categorization published previously by Stoll et al. (2015). We modified the Stoll et al. classification to include "procrastination barrier" because some of our participants' responses were related to keep postponing the mammography. In the present study, barriers were categorized as follows: (1) procrastination barriers (not having time or too busy, keep postponing it—e.g., "I don't have time" or "I'll wait until vacations"); (2) structural barriers (lack of transportation, lack of insurance, and lack of care for dependents or family members—e.g., "The office is too far and I don't have a car," "I don't have health insurance," "It is expensive," or "I have a family member who is sick"); (3) lack of physician/nurse recommendation (e.g., "Physician told me it was not necessary because of my age," "Physician told me to come back in 2 years," "I haven't received a referral to go," or "I haven't received a recommendation"); (4) emotional barriers (embarrassment, fear of test pain, fear of finding something wrong, or unspecified fear—e.g., "I don't like my breasts to be seen," "It is too painful," "I'm scared of the machine," "I'm scared because he [physician] might ask for a biopsy," or "I'm scared to have cancer"); (5) cognitive barriers (responses that indicated lack of breast cancer knowledge or beliefs against breast cancer screening—e.g., "I do not believe I am at the age for screening," "My last mammography read normal," or "I only believe in natural alternative medicine and not in invasive procedures"); and (6) other barriers (responses that could not be classified in previous categories—e.g., "I just turned 40 years old," "Because I don't want to," or "I do not have the papers").

### Psychosocial Constructs

CLS baseline survey assessed psychosocial constructs (self-efficacy, beliefs about mammography, and subjective norms), which were adapted from previous study (Fernández et al., 2009).

**Self-Efficacy.**—Participants were asked about their beliefs in their capacity to get a mammography. Self-efficacy constructs have the following seven items: (1) How sure are you that you can make and keep an appointment to have a mammography? (2) How sure are you that you can still have a mammography, even if you had to go to a different place than the last time? (3) How sure are you that you can ask your doctor to send you for a mammography? (4) How sure are you that you can get a mammography even if you are worried that it will hurt you? (5) How sure are you that you can get a mammography even if a friend has discouraged you from having one? (6) How sure are you that a mammography can be done even if you have examined your breasts and find nothing abnormal? and (7) How sure are you that you can get a mammography even if you have to pay for it? The responses for each item were answered with a 5-point Likert-type response scale from *completely unsure* = 1 to *completely sure* = 5.

**Beliefs About Mammography.**—Participants were asked their level of agreement with the possible pros (benefits) and cons (disadvantages) in getting a mammography. Pros and cons constructs have four items each. The construct assessing beliefs about mammography (pros) has the following items: (1) having a mammography every year would make you feel like you are in control of your health, (2) getting a regular mammography gives you a feeling of calm about your health, (3) a mammography is necessary even if there is no history of breast cancer in the family, and (4) any discomfort caused from having a mammogram is worth the benefits gained. The construct assessing belief about mammography (cons), has the following items: (1) the grief or embarrassment caused by a mammography makes you think twice about getting one; (2) you are too busy to have a mammography; (3) visiting your doctor, asking for a referral for a mammography, making an appointment, and having a mammography takes too long; and (4) you probably wouldn't have a mammography if a family member or friend told you it was painful. Beliefs about mammography items for both, pros and cons, were answered with a 5-point Likert-type response scale from *strongly disagree* = 1 to *strongly agree* = 5.

**Subjective Norms.**—Participants were asked the level of agreement if people they know will approve their decision of having a mammography. Subjective norms have the following six items: (1) your family thinks you should have a mammography, (2) you want to do what your family thinks you should do about having a mammography, (3) your close friends think you should have a mammography, (4) you want to do what your friends think you should do about having a mammography, (5) the doctor thinks you should have a mammography, and (6) you want to do what the doctor thinks you should do about having a mammography. Subjective norms items were answered with a 5-point Likert-type response scale from *strongly disagree* = 1 to *strongly agree* = 5.

For analysis purposes, we calculated the mean score of each psychosocial construct (self-efficacy, beliefs about mammography, and subjective norms). A higher score indicates greater endorsement of the psychosocial construct.

### Statistical Analysis

We used SPSS version 21.0 (IBM Corp., Armonk, NY) for all statistical analyses. We conducted a chi-square test to examine differences between study groups (never and previously screened) on categorical variables (age, education, income, marital status, health insurance, usual source of care, perceived health status, pap test adherence, and family history of breast cancer). We performed a *t* test to compare psychosocial constructs related to mammography between never and previously screened women. We also performed a chi-square test to examine differences on perceived barriers for screening between never and previously screened women overdue for screening.

We then calculated unadjusted and adjusted prevalence odds ratios (POR and aPOR, respectively, with their 95% confidence to measure the association of independent variables with never screened status. To determine which variables were going to be included in the logistic regression analysis, first, we selected the variables associated to never screened status that had a *p* value equal to or less than .25 in the bivariate analysis.

Second, we examined those variables that were not correlated using Pearson correlation coefficient and the two-tailed  $p$  value. Variables selected in the first step were not correlated, thus we adjusted the multivariate logistic regression model by age, education, annual household income, marital status, health insurance, usual source of care, Pap test adherence, mammography self-efficacy, beliefs about mammography cons, and subjective norms.

## Results

### Description of the Study Sample

The prevalence of never screened among women nonadherent to breast cancer screening was 18.0%. The mean age of the study sample was 55.3 ( $SD = \pm 10.7$ ) years. Most of the study participants reported having an education equal to or less than 12 years (55.3%), an income less than \$15,000 (67.8%), and being married or cohabitating (57.7%) at the time of the interview. About half of the participants reported having a GHP (51.7%), and the majority reported having a usual source of care (72.0%) during the past year. Among women who had never had a mammography, only 42% of the participants were adherent to the Pap test (42.6%), and 11.1% of the women reported a family history of breast cancer (Table 1).

### Differences Between Never Screened and Previously Screened Women

Bivariate analysis showed that never screened women were significantly younger (mean age =  $49.15 \pm 9.81$  vs.  $56.59 \pm 10.42$  years;  $p < .001$ ) and had lower annual household income in comparison with previously screened women ( $p = .003$ ). Never screened women were significantly more likely to have GHP ( $p < .001$ ) and not have a usual source of care ( $p < .001$ ; Table 1).

Never screened women had statistically lower levels of self-efficacy ( $p < .001$ ) compared with previously screened women. Subjective norms for breast cancer screening in never screened women were not statistically significant ( $p = .22$ ) when compared with those previously screened. Although we found no statistical differences in the beliefs about mammography (pros), differences in the cons for screening between study groups were statistically different ( $p = .42$  and  $p < .007$ , respectively). Never screened women were more likely to endorse the cons (negative beliefs) about mammography screening (Table 1).

### Differences in Perceived Barriers for Screening Between Never Screened and Previously Screened Overdue for Screening Women

Some of the barriers that prevented nonadherent women from having breast cancer screening were procrastination (47.1%), emotional barriers (21.4%), and structural barriers (14.4%). We compared reported data by never screened women and previously screened women overdue for screening. Never screened women reported almost triple the number of cognitive barriers in comparison with previously screened women (20.4% vs. 7.5%,  $p = .01$ ). Never screened women were also more likely to report lack of recommendation (16.7% vs. 9.0%) than previously screened; differences, however, were not statistically significant ( $p = .13$ ). There were no statistically significant differences in structural barriers between study groups ( $p = .20$ ). Never screened women reported more emotional barriers and less procrastination

barriers than previously screened women; the differences were not statistically significant ( $p = .08$  and  $p = .08$ , respectively; Table 2).

### Factors Associated to Never Screened Status

Unadjusted logistic regression model (Table 3) showed that women aged 40–49 years old were almost five times more likely to be never screened (POR = 4.72, 95% CI: [2.06, 10.85]). Uninsured and women with GHP showed similar likelihood to be associated with never screened status (POR = 4.30, 95% CI: [1.41, 13.08] and POR = 4.54, 95% CI: [2.03, 10.15, respectively]). Also, never screened women were more than three times more likely to have an annual household income of less than \$15,000 (POR = 3.36, 95% CI: [1.45, 7.81]) and more than two times more likely to not have a Pap test in the past 3 years (POR = 2.22, 95% CI: [1.22, 4.03]).

Adjusted models showed that never screened women were more than seven times as likely to be aged 40 to 49 years old (aPOR = 7.32, 95% CI: [2.38, 22.50]) and almost four times as likely to have a GHP (aPOR = 3.78, 95% CI: [1.15, 12.46]), in comparison with previous screened women, after adjusting for covariates. Additionally, perceived cons were significantly associated with never screened status; for every one-unit increase in the cons score, never screened status increased by 81% (aPOR = 1.81, 95% CI: [1.18, 2.78]; Table 3).

### Discussion

Approximately one fifth of the women in our sample had never had a mammography screening. To our knowledge, this is the first time a study has explored factors associated with never being screened as part of an intervention trial. Our findings reflect the independent effect of age, type of health insurance, and beliefs about mammography (cons) on never screened status.

It is not surprising that younger age (40–49 years) was strongly associated with a never screened status since many of these women may be following another screening guideline that recommends starting mammography at age 50 years (Siu, 2016). At the time of the parent study, ACS guidelines recommended an annual breast cancer screening beginning at 40 years old; but other cancer screening guidelines, such as the U.S. Preventive Services Task Force (USPSTF), recommended annual or biannual breast cancer screening beginning at age 50 years (Siu, 2016). Inconsistencies in screening guidelines may have contributed to the strong impact of younger age on never screened status. Recent changes in ACS guidelines (Oeffinger et al., 2015) still differ from those of the USPSTF and could delay breast cancer screening in women aged 40 to 49 years. In PR, most of the invasive breast cancer diagnoses (83.3%) are in women aged 40 to 49 years (Torres-Cintrón et al., 2020). Furthermore, a recent study found that when the proportion of breast cancer deaths in unscreened women is evaluated by age-group, a higher proportion of deaths are observed in women younger than 40 and between 40 and 49 years (85% and 70%, respectively) versus 49% and 47% of deaths in older women (60–69 years and 70 years, respectively; Webb et al., 2014). Therefore, findings suggest that efforts to promote breast cancer screening in younger women in PR are warranted.

Women with GHP were almost four times as likely to be never screened. In PR, the lack of health care coverage or a health provider should not be barriers for screening behavior due to the fact that the vast majority of the population is either covered with private or GHP health insurance (91.7%; Centers for Disease Control and Prevention, 2015). Still, our results suggest that health care disparities exist among women with GHP in comparison with women with a private health plan. GHP was created by legislation in 1993 to provide quality health care services to an underserved or medically indigent population (Oficina de Gerencia y Presupuesto, 2021). In our study, more than 70% of the never screened women were insured by GHP, and we found that GHP-insured women were significantly more likely to be never screened, even after controlling for possible confounders such as age and income. Similar to women with private health insurance, women with GHP require referrals for cancer screening tests, such as mammography. A possible explanation is that women with GHP did not received breast cancer screening referral as frequently as the women with private health insurance. On the other hand, it is important to acknowledge that even if women are given a referral, other barriers such as convenient times and wait for appointment are also important issues to consider.

Several psychosocial variables were correlated with never screened status, but only the cons for mammography (or negatives beliefs about mammography) were associated in the adjusted logistic regression. We did not observe differences in perceived pros of mammography screening between ever and never screened women. However, never screened women had a higher endorsement of perceived cons, tipping their beliefs about mammography negatively. The transtheoretical model of health behavior change assumes that there are processes (e.g., decisional balance) that may explain the progress in the stages of behavioral change (Salinas-Martinez et al., 2018). A recent study found that never screened women with no intention to undergo a mammography in the next 12 months (precontemplation stage) had more cons and less pros about mammography (Prochaska & Velicer, 1997). It is possible that never screened women in our study were in the precontemplation stage by having significantly more cons for screening in comparison with previously screened women. Also, the transtheoretical model supposed that people in the precontemplation stage are uninformed or underinformed about the consequences of their behavior (Salinas-Martinez et al., 2018). Therefore, this model may explain as well the report of more cognitive barriers by never screened women. These findings suggest the potential need for targeted messages to increase breast cancer screening knowledge and to address perceived cons for mammography among never screened women.

There are several limitations to this study. First, the study was cross-sectional; therefore, it is difficult to interpret the direction of the relationship between the independent variables and screening status. A small sample size reflected in some of our bivariate analysis is also a limitation. Cancer screening status was obtained through a patient survey, which could be affected by recall or social response bias. Since data were collected from women who participated in a health promotion intervention conducted only among nonadherent women in Canóvanas, PR, results cannot be generalized to other Puerto Rican women or to Hispanics living in the United States.



Results from this study suggest that there exist health care disparities regarding access to mammography by never screened women insured with GHP. In 2013, the GHP reported providing health care services to 1.6 million participants, and despite differences between ACS and USPSTF breast cancer screening guidelines, GHP recommended mammography for women beginning at age 40 years (Administración de Seguros de Salud de Puerto Rico, 2013; Triple-S Salud, Inc., n.d.). Public health policies should address disparities in access to mammography screening. Future research should include larger studies of the general population of Puerto Rican women to determine if the findings of the current study are broadly applicable.

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**Table 1.** Factors Associated with Nonadherence to Mammography Screening Among Hispanic Women Living in Puerto Rico.

Characteristics	Total sample (n = 300)		Never screened (n = 54)		Previously screened (n = 246)		p
	n	(%)	n	(%)	n	(%)	
Age (years)							
40–49	109	(36.3)	33	(61.1)	76	(30.9)	<.001
50–59	96	(32.0)	13	(24.1)	83	(33.7)	
60	95	(31.7)	8	(14.8)	87	(35.4)	
Education (years)							
12	166	(55.3)	35	(64.8)	131	(53.3)	.12
>12	134	(44.7)	19	(35.2)	115	(46.7)	
Income <sup>a</sup>							
<\$ 15,000	192	(67.8)	42	(85.7)	150	(64.1)	.003
\$ 15,000	91	(32.2)	7	(14.3)	84	(35.9)	
Marital status							
Married/living together	173	(57.7)	29	(53.7)	144	(58.5)	.12
Never married	41	(13.7)	12	(22.2)	29	(11.8)	
Divorced/separated/widowed	86	(28.7)	13	(24.1)	73	(29.7)	
Health insurance							
Private	116	(38.7)	8	(14.8)	108	(43.9)	
Government health plan	155	(51.7)	39	(72.2)	116	(47.2)	<.001
Uninsured	29	(9.7)	7	(13.0)	22	(8.9)	
Usual source of care <sup>b</sup>							
Yes	213	(72.0)	27	(50.9)	186	(76.5)	<.001
No	83	(28.0)	26	(49.1)	57	(23.5)	
Perceived health status							
Excellent or very good	67	(22.3)	14	(25.9)	53	(21.5)	.33
Good	100	(33.3)	21	(38.9)	79	(32.1)	
Average or bad	133	(44.3)	19	(35.2)	114	(46.3)	
Pap test adherence							
Yes	176	(58.7)	23	(42.6)	153	(62.2)	.008

Characteristics	Total sample (n = 300)		Never screened (n = 54)		Previously screened (n = 246)		p
	n	(%)	n	(%)	n	(%)	
No	124	(41.3)	31	(57.4)	93	(37.8)	
Family history of breast cancer <sup>c</sup>							
Yes	28	(9.4)	6	(11.1)	22	(9.1)	.64
No	269	(90.6)	48	(88.9)	221	(90.9)	

Mammography-related variables	M (SD)	M (SD)	M (SD)	p
Self-efficacy	4.18 (0.85)	3.80 (0.96)	4.26 (0.80)	<.001
Beliefs about mammography (pros)	4.49 (0.60)	4.43 (0.59)	4.50 (0.60)	.42
Beliefs about mammography (cons)	2.33 (0.88)	2.62 (1.05)	2.26 (0.82)	.007
Subjective norms	3.61 (0.82)	3.49 (0.92)	3.64 (0.80)	.22

<sup>a</sup>Missing data for 17 participants.

<sup>b</sup>Missing data for 4 participants.

<sup>c</sup>Women who answered "do not know" to breast cancer family history (n = 3) were excluded from the analysis.

**Table 2.** Breast Cancer Screening Perceived Barriers for Mammography Screening Among Never Screened Women and Previously Screened Women Overdue for Screening: Cultivando la Salud, Puerto Rico ( $n = 187$ ).<sup>a</sup>

Perceived barriers	Sample ( $n = 187$ )		Never screened ( $n = 54$ ) <sup>b</sup>		Previously screened ( $n = 113$ ) <sup>c</sup>		<i>p</i>
	<i>n</i>	(%)	<i>n</i>	(%)	<i>n</i>	(%)	
Procrastination barriers	88	(47.1)	20	(37.0)	68	(51.1)	.08
Emotional barriers	40	(21.4)	16	(29.6)	24	(18.0)	.08
Structural barriers	27	(14.4)	5	(9.3)	22	(16.5)	.20
Lack of physician recommendation	21	(11.2)	9	(16.7)	12	(9.0)	.13
Cognitive barriers	21	(11.2)	11	(20.4)	10	(7.5)	.01

<sup>a</sup>Seventeen participants answered more than one barrier.

<sup>b</sup>Missing data for one participant.

<sup>c</sup>Previously screened women with last mammography more than 2 years prior to baseline.

Table 3.

Association of Sociodemographic Characteristics, Health Care Access, Pap Test Adherence, and Psychosocial Variables With a Never Screened Status.

Characteristics	Model aPOR <sup>a</sup>	[95% CI]	p
Age (years)			
40–49	7.32	[2.38, 22.50]	.001
50–59	1.60	[0.50, 5.13]	.43
60	1.00	[Reference]	
Education (years)			
12	1.97	[0.84, 4.60]	.12
>12	1.00	[Reference]	
Income			
<\$ 15,000	1.45	[0.44, 4.78]	.54
\$ 15,000	1.00	[Reference]	
Marital status			
Married/living together	1.00	[Reference]	
Never married	2.08	[0.74, 5.83]	.16
Divorced/separated/widowed	1.49	[0.60, 3.73]	.40
Health insurance			
Private	1.00	[Reference]	
Government health plan	3.78	[1.15, 12.46]	.03
Uninsured	2.46	[0.55, 11.09]	.24
Usual source of care			
Yes	1.00	[Reference]	
No	1.52	[0.65, 3.55]	.33
Pap test adherence			
Yes	1.00	[Reference]	
No	1.98	[0.94, 4.15]	.07
Mammography-related variables			
Self-efficacy	0.66	[0.44, 1.01]	.06
Beliefs about mammography (cons)	1.81	[1.18, 2.78]	.006
Subjective norms	1.11	[0.69, 1.77]	.67

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Note. aPOR = adjusted prevalence odds ratio.

<sup>a</sup>Model adjusted by age, education, annual household income, marital status, health insurance, usual source of care, Pap test adherence, mammography self-efficacy, cons, and subjective norms.