Literacy and Knowledge, Attitudes and Behavior About Mammography in Latinas

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Abstract: This cross-sectional study explored the association between functional health literacy and the knowledge, beliefs, attitudes, and behavior about mammography and self-breast examination in a sample of Latinas attending community health clinics in Philadelphia. The results show that 70% of Latinas had inadequate or marginal functional health literacy. In Latinas, functional health literacy is only weakly associated with knowledge and not associated with beliefs and attitudes about screening mammography, but is significantly associated with having ever had a mammogram. After adjusting for demographic characteristics, functional health literacy was significantly associated with having ever had a mammogram (odds ratio [OR] 1.14, 95% confidence interval [CI] 1.02–1.27). These findings suggest that Latinas with poor functional health literacy are less likely to undergo mammography. Future research should target increasing the knowledge about and rates of screening mammography in patients with low functional health literacy.

Key words: Mammography, mass screening, Hispanic Americans, knowledge, attitudes, behavior, educational status.

Breast cancer is the most commonly diagnosed cancer and the leading cause of cancer deaths among Latinas.[1,2] It is known that Latinas are less likely than non-Hispanic white women to obtain mammograms.[3–5] The National Health Interview Survey has shown that only 60% of Hispanic women over 40 years of age, compared with 70% of white women and 67% of black women, have had a mammogram in the past 2 years.[4] These differences have been demonstrated even within a prepaid health plan where direct financial barriers to cancer screening services have been removed.[3] Lower participation in mammography screening may, at least in part, explain why Latinas frequently present with more advanced breast cancer than other women.[5]

There is an extensive literature examining the barriers experienced by Latinas to undergoing breast cancer screening. These barriers include sociodemographic status;

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lack of access to and a usual source of health care; lack of knowledge; and practices, beliefs, and attitudes such as neglect of one's health (*descuido*), fatalism, and fear.[6–20] Furthermore, studies that have evaluated the barriers to breast cancer screening by ethnoregional subgroups of Latinas have shown that screening rates, and the barriers to screening, vary by subgroup.[19–21]

Despite what we know about breast cancer screening in Latinas, little is known about how low health literacy skills may affect knowledge of, attitudes related to, and behavior related to breast cancer screening in this population. *Health literacy* has been defined by the American Medical Association as the ability to read, understand, and act on health information.[22] Previous research has shown that health literacy skills are important to knowledge, beliefs, attitudes, and behavior related to disease prevention.[23–25] Furthermore, the Latino population in the U.S. has a higher prevalence of inadequate functional health literacy than the general population because of a lower educational status and a higher prevalence of acquiring English as a second language. In some states, as much as 56–69% of the Latino community is functionally illiterate about health care.[26] Therefore, limited functional health literacy may pose a significant barrier to breast cancer screening among Latinas.

This study set out to explore the association between functional health literacy and knowledge, beliefs, attitudes, and behavior regarding mammography screening and self-breast examination in Philadelphia's Latina community. We hypothesized that, in Latinas, poor health literacy skills would be associated with poorer knowledge, and negative beliefs and attitudes about breast cancer screening, and would present a barrier to undergoing breast cancer screening.

Methods

A convenience sample of patients waiting to see their physicians at three community clinics in the Philadelphia area (Maria De Los Santos Health Center, Temple Community Medical Center, and Norristown Regional Health Center) were invited to participate in this study. To be eligible, women had to be over 40 years of age, of Hispanic ethnicity, have had no prior history of breast cancer, and be able to speak English or Spanish. After obtaining informed consent, a trained interviewer administered a battery of instruments that included a demographics questionnaire and a structured 60-item breast cancer screening questionnaire to assess five areas: knowledge, beliefs, attitudes, and behavior about mammography, as well as self-breast examination, and influences on mammography screening. In addition, each patient was administered an acculturation scale, the Short Acculturation Scale for Hispanics[27] and the Short Test of Functional Health Literacy in Adults (STOFHLA).[28] The study instruments were administered in either English or Spanish, whichever was preferred by the patient.

Demographic items included queries about age, education, race and ethnicity, marital status, household income, health insurance provider, and whether the medical staff spoke in a language that the patient could understand. The items about breast cancer screening were adapted from an instrument previously developed in English for a study of low-literacy, low-income populations.[23] It was translated into Spanish using standard double translation methods.[27] Knowledge and behavior items

in the breast cancer screening questionnaire required a variety of closed-end responses (e.g., yes/no/don't know; within 1 year, between 1–2 years). Belief, attitude, and influence items requested responses on 5-point adjectival scales using three different sets of anchors: very good to very poor; extremely concerned to not at all concerned; and definitely not to definitely yes. The Short Acculturation Scale for Hispanics [27] includes 12 questions about language preferences including the language(s) used to think, currently spoken, spoken as a child, spoken at home, spoken with friends, used in movies and television programs watched, and used on radio programs listened to. The responses are anchored on a 5-point adjectival scale from only Spanish to only English. The remainder of the items asked about the ethnicity of close friends, social acquaintances, persons visited by the responder, and the ethnicity preferred for children's friends. The anchors for these responses ranged from all Latinos to all Americans. The reliability and validity of the Short Acculturation Scale for Hispanics is reported to be comparable to other, longer acculturation scales.[27] The entire questionnaire was extensively pilot tested and revised before the initiation of the study to ensure that it was culturally sensitive and comprehensible by Latina patients.

The STOFHLA is a health literacy assessment instrument based on the Modified Cloze procedure that requires subjects to read two passages that summarize instructions for preparation for an upper GI series and the patient rights and responsibilities section from a Medicaid application form. There are 36 items and the test takes 7 minutes to administer. Readability levels on the Gunning Fog index are grades 4.3 and 10.4, respectively, for the two passages. The STOFHLA is available in English and Spanish; the Spanish translation is currently the only functional health literacy instrument that has been validated for Latinos.[28] The raw STOFHLA scores are classified into inadequate (scores 0–16), marginal (scores 17–22), and adequate (scores 23–36). Patients who indicated they could not read at all were assigned a score of 0.

The Institutional Review Board at the University of Pennsylvania approved this study. The entire battery of instruments required approximately 20–30 minutes to administer. Puerto Rican women made up almost two thirds of our sample and, consequently, a subgroup analysis was performed to evaluate differences between Puerto Rican and non–Puerto Rican Latinas.

Statistical analysis. Statistical Analysis System (SAS) Version 6.11[29] and STATA Version 7.0[30] were used to conduct the statistical analysis of the data. Descriptive statistics for each item were calculated for the total group of responders and stratified by functional health literacy. Functional health literacy was dichotomized into two groups based on STOFHLA scores: adequate and inadequate functional health status group, the latter being made up of those whose TOFHLA score fell in the inadequate or marginal health literacy range. For the demographic comparisons between the two groups, age and acculturation were treated as continuous variables; education was categorized as less than high school, high school diploma/GED, or some education beyond high school; marital status (married versus not married), household income (≤$10,000 versus >$10,000) and insurance status (insured versus not insured) were dichotomized. Demographic differences between the two health

literacy groups were compared using chi-square or *t*-tests. The main analyses, examining the relationship of health literacy to mammography knowledge, attitudes, beliefs, behaviors, and influences, were logistic regressions. For group comparisons, all mammography items were dichotomized into categories such as correct/incorrect and agree/disagree. Unadjusted models used only health literacy level (continuous) as an independent variable. Adjusted models included education, age, acculturation, and insurance status as independent variables. Odds ratios (OR) are presented along with 95% confidence intervals (CI). Standard interpretation is that the relationships are statistically significant when the intervals do not include 1.00.

Results

Two hundred fifty-four patients waiting to see their providers were invited to participate between April and September 2001. Of these, 145 (57%) patients met the eligibility criteria. Twelve (5%) patients were not interviewed because they were called away after initial contact, 5 (2%) patients refused to participate, and 92 (36%) patients were not eligible to participate. Of the 145 eligible patients, only 100 (69%) had sufficient time to complete the STOFHLA and mammography instruments. Three patients were excluded from the analysis because they were unable to take the STOFHLA because they did not have their reading glasses. Seven patients reported they could not read at all and were assigned a STOFHLA score of 0. The final sample size consisted of 97 patients who represented 67% of the eligible population. A comparison of the 97 study completers and the 48 noncompleters did not demonstrate any significant differences in age ($p = 0.28$), education ($p = 0.29$), marital status ($p = 0.22$), income ($p = 0.44$), or language spoken with their physician ($p = 0.24$).

Demographics. Demographic characteristics of the study population are illustrated in Table 1. All subjects were women and self-reported Latinas. The mean age was 58 years (standard deviation [SD] 10, range 41–85). The majority of women were divided among three decades of age spanning 40–70 years. Seventy-five percent of the women had less than a high school education; a minority had graduated from high school (12%) or had post-high school education (13%). Slightly under a third (32%) of the women were married. Approximately two thirds (63%) of the women had a household income of less than $10,000 per year. Twenty-six percent of the women in this sample were uninsured. Only 3% reported that the medical staff did not speak in a language they could understand. The mean acculturation score for the sample was 1.69 (SD = 0.5), on the 5-point acculturation scale, representing a group with low acculturation. Sixty-two of the 97 women identified themselves as being of Puerto Rican descent. The countries of origin for the remaining 35 women were: Colombia ($n = 10$), Dominican Republic ($n = 7$), Mexico ($n = 6$), Peru ($n = 4$), Nicaragua ($n = 3$), Costa Rica ($n = 2$), Honduras ($n = 1$), Venezuela ($n = 1$), and Argentina ($n = 1$) (data not shown in table).

STOFHLA. The mean STOFHLA score was 17 (SD = 11), indicating marginal functional health literacy skills. Slightly over half (52%) of the women had inadequate functional health literacy, 18% had marginal functional health literacy, and 30% had adequate functional health literacy. For the analyses that follow, this

Table 1.

DEMOGRAPHIC CHARACTERISTICS

	All patients *n* (%)	Functional health literacy		*p*
		Inadequate *n* (%)	Adequate *n* (%)	
Age (y) ($n = 97$)				0.0045
Mean (SD)	58 (10)	59.7 (10)	53.4 (8)	
Range	41–85	41–85	42–73	
Education ($n = 94$)				0.0024
Less than high school	71 (75%)	55 (85%)	16 (55%)	
High school diploma or GED	11 (12%)	7 (11%)	4 (14%)	
Some education beyond high school	12 (13%)	3 (5%)	9 (31%)	
Marital status ($n = 90$)				0.73
Married	29 (32%)	21 (33%)	8 (30%)	
Not married	61 (68%)	42 (67%)	19 (70%)	
Household income ($)[a] ($n = 71$)				0.49
<10,000	45 (63%)	28 (67%)	17 (59%)	
>10,000	26 (37%)	14 (33%)	12 (41%)	
Not insured ($n = 97$)	25 (26%)	21 (31%)	4 (13%)	0.06
Medical staff speaks in language patient can understand ($n = 95$)	92 (97%)	64 (98%)	28 (93%)	0.18
Acculturation scale [mean (SD)] ($n = 85$)	1.69 (0.5)	1.60 (0.5)	1.90 (0.7)	0.02

[a] Twenty-six patients reported not knowing their household income.

sample was dichotomized into adequate and inadequate health literacy, the latter group representing the women who had STOFHLA scores in the inadequate and marginal ranges.

Compared with patients with adequate health literacy, those with inadequate health literacy were more likely to be older ($p = 0.0045$), to have less than a high school education ($p = 0.0024$), and to be less acculturated ($p = 0.02$). There was no difference between the two groups in the proportion of women who were married ($p = 0.73$), had a household income of less than $10,000 ($p = 0.49$), were uninsured ($p = 0.06$), or could speak with the medical staff in a language she could understand ($p = 0.18$). In addition, there were no significant differences by health literacy in self-reported overall health ($p = 0.54$), the proportion that reported having a regular source of care ($p = 0.17$), or the proportion having a regular health care provider ($p = 1.00$) (data not shown in the table).

Knowledge. As shown in Table 2, all but one woman (99%) had heard of a mammogram. Functional health literacy was not associated with the knowledge

Table 2.

KNOWLEDGE ABOUT MAMMOGRAPHY AND FUNCTIONAL HEALTH LITERACY

		Functional health literacy		Other significant demographic variables
	Total group *N* (%)	Unadjusted odds ratio (95% CI)	Adjusted odds ratio (95% CI)	Adjusted odds ratio (95% CI)
Heard of mammography	95 (99%)	N/C	N/C	N/C
Age when begin mammography (40–50)	28 (30%)	1.02 (0.98–1.06)	1.01 (0.96–1.07)	
Recommended frequency of mammography (every 1–2 years)	66 (68%)	1.02 (0.98–1.07)	1.11 (1.04–1.19)*	Education: 0.50 (0.27–0.92) Acculturation: 0.29 (0.10–0.90)
Know where to go for mammography	75 (83%)	1.03 (0.98–1.09)	1.02 (0.95–1.10)	No insurance: 0.13 (0.03–0.50)
Know when a self-breast exam should be performed with respect to menses (after menses)	22 (30%)	0.99 (0.95–1.04)	0.94 (1.00–1.07)	

Abbreviation: N/C, not calculated.
* Significant association, the 95% CI does include 1.00.

items. After adjusting for the demographic characteristics associated with health literacy, higher health literacy was associated with knowledge of the recommended frequency of mammography (OR 1.11, 95% CI 1.04–1.19). Relatively low education and acculturation were associated with decreased odds of having adequate knowledge of recommended frequency of screening mammography (OR 0.50, 95% CI 0.27–0.92 and OR 0.29, 95% CI 0.10–0.90, respectively). Compared with having health insurance, not having insurance was associated with decreased odds of knowing where to go for mammography (OR 0.13, 95% CI 0.03–0.50).

Attitudes and beliefs. As shown in Table 3, women's attitudes about mammography were favorable. Functional health literacy was not associated with women's attitudes or beliefs about mammography. After adjusting for demographic variables, functional health literacy was not significantly associated with attitudes or beliefs about mammography screening. Older age was associated with decreased odds of expressing any concern about cost of mammography compared with being

Table 3.

ATTITUDES AND BELIEFS AND FUNCTIONAL HEALTH LITERACY

		Functional health literacy		Other significant demographic variables
	Total group N (%)	Unadjusted odds ratio (95% CI)	Adjusted ODDS RATIO (95% CI)	Total group N (%)
"Extremely" to "a little" vs. "not at all" concerned about mammography being painful	61 (63%)	1.03 (0.99–1.07)	0.99 (0.94–1.05)	
"Extremely" or "a little" vs. "not at all" concerned you will find out you have cancer	64 (67%)	1.05 (1.00–1.09)	1.03 (0.98–1.09)	
If have cancer, want to know	87 (90%)	1.00 (0.95–1.07)	1.07 (0.98–1.18)	
"Extremely" or "a little" vs. "not at all" concerned about mammography being embarrassing	36 (38%)	0.98 (0.94–1.02)	0.96 (0.91–1.02)	
"Extremely" or "a little" vs. "not at all" concerned about mammography being harmful	24 (25%)	0.99 (0.95–1.03)	0.97 (0.91–1.03)	
"Extremely" or "a little" vs. "not at all" concerned about cost of mammography	36 (38%)	0.97 (0.93–1.01)	0.97 (0.92–1.03)	Age: 0.92 (0.87–0.98) No insurance: 8.07 (2.34–27.70)
It is troublesome to get a mammogram	25 (26%)	0.98 (0.94–1.02)	0.96 (0.90–1.03)	
Mammography is "very" or "a little" vs. "not at all" or "not very" effective in finding cancer early	77 (87%)	1.06 (1.00–1.12)	1.07 (0.97–1.17)	

(continued)

Table 3. Continued.

		Functional health literacy		Other significant demographic variables
	Total group N (%)	Unadjusted odds ratio (95% CI)	Adjusted ODDS RATIO (95% CI)	Total group N (%)
If found early "very good" or "good" vs. "very poor" to "OK" chance breast cancer can be cured	60 (67%)	1.02 (0.98–1.06)	0.99 (0.93–1.06)	No insurance: 6.49 (1.25–33.79) Acculturation: 4.01 (1.10–14.56)
If found late "very good," "good" or "OK" vs. "very poor" or "poor" chance breast cancer can be cured	29 (33%)	1.03 (0.99–1.07)	1.02 (0.97–1.08)	
"For sure" or "probable" vs. "not at all," "probably not" or "maybe" chance of getting breast cancer	17 (18%)	1.00 (0.96–1.05)	1.01 (0.95–1.08)	Age: 0.92 (0.85–0.99)

"not at all" concerned (OR 0.92, 95% CI 0.87–0.98). Older age was associated with decreased odds of reporting having a "probable" or "for sure" chance of getting cancer compared with reporting "not at all" having a chance of getting it or having a "probable" or "maybe" chance of getting it (OR 0.92, 95% CI 0.85–0.99). Not having health insurance (versus having it) was associated with being more likely to report being concerned than to report being "not at all" concerned about the cost of mammography (OR 8.07, 95% CI 2.34–27.70). Not having insurance (versus having it) was also associated with the belief that if cancer is found early it has a "good" to "very good" chance of cure compared as opposed to a "very poor," "poor," or "OK" chance of cure (OR 6.49, 95% CI 1.25–33.79). Higher acculturation scores (versus lower) were also associated with the belief that if cancer is found early there is a "good" to "very good" chance for it to be cured (rather than a "very poor," "poor," or "OK" chance of cure) (OR 4.01, 95% CI 1.10–14.56).

Behavior. As shown in Table 4, 88% of the participants had ever had a mammogram. Slightly over two-thirds (69%) had had a mammogram within the past year and 84% had had a mammogram within the last 2 years. In the unadjusted analyses, functional health literacy was not associated with behaviors related to breast cancer screening. After adjusting for demographic characteristics, functional health literacy was associated only with a greater odds of having ever had a

mammogram (OR 1.14, 95% CI 1.02–1.27). Older age was significantly associated with ever having had a mammogram (OR 1.24, 95% CI 1.09–1.41), having had a mammogram within the last year (OR 1.08, 95% CI 1.00–1.16), and having undergone mammography as part of a check-up (OR 1.11, 95% CI 1.02–1.21). Not having health insurance (versus having health insurance) was associated with a decreased likelihood of reporting having had a mammogram in the last 2 years (OR 0.17, 95% CI 0.04–0.75).

Influences on behavior. As shown in Table 5, in unadjusted analyses, functional health literacy was associated with greater odds of having been told by a doctor to get a mammogram (OR 1.11, 95% CI 1.03–1.18), and having learned about mammography from a doctor (OR 1.05, 95% CI 1.01–1.09). In adjusted models, functional health literacy was associated with the likelihood of getting versus not getting a mammogram if the doctor said she might have cancer (OR 1.24, 95% CI 1.02–1.50). In addition, older age was associated with having someone say that a mammogram should be administered (OR 1.13, 95% CI 1.03–1.25). Younger age (OR 0.91, 95% CI 0.83–0.99) and not having insurance (OR 0.05, 95% CI 0.01–0.35) were associated with decreased odds of having a doctor say a woman should have a mammogram. Lower acculturation scores were associated with having a friend recommend mammography (OR 0.21, 95% CI 0.07–0.69).

Differences between Puerto Rican and non–Puerto Rican Latinas. Latinas represent a diverse group of women of all known human races who share an origin in Latin America, a vast geographical area that includes part of the U.S. (Puerto Rico), Central and South America, and the Caribbean (e.g., Cuba, Dominican Republic). It therefore seems likely that Latinas represent a heterogeneous group of subcultures, each of which may have distinct models of health and health beliefs, attitudes, and practices about preventive health care.

Our sample of Latinas consisted predominantly of women of Puerto Rican descent (62 of 97). We conducted a subgroup analysis of the 62 Puerto Rican women, comparing their demographic characteristics and their responses with those of the 36 women of non–Puerto Rican descent. Comparison of demographic characteristics showed that there were no differences between Puerto Rican women and non–Puerto Rican women with regard to age ($p = 0.63$), education ($p = 0.30$), marital status ($p = 0.08$), income ($p = 0.24$), self-reported overall health (0.76), proportion reporting having a regular source of care ($p = 1.00$) and a regular health care provider ($p = 0.27$), or mean acculturation scores (1.69 versus 1.67, respectively, $p = 0.84$). There was, however, a statistically significant difference in the proportion of women reporting they had no insurance in each of the groups, with 10% of the Puerto Rican and 54% of the non–Puerto Rican women reporting they had no insurance ($p = 0.0001$). There was no difference between the mean STOFHLA score of the Puerto Rican women and that of the non–Puerto Rican women (17.3 and 16.3, respectively; $p = 0.67$).

There were only a few important differences in beliefs, attitudes, knowledge, and behavior between the two groups of women. In unadjusted analyses, Puerto Rican women were more likely than non–Puerto Rican women to know where to go to obtain a mammogram (OR 5.14, 95% CI 1.57–16.84) and more likely to believe

Table 4.

BEHAVIORS RELATED TO MAMMOGRAPHY AND SELF-BREAST EXAM AND FUNCTIONAL HEALTH LITERACY

		Functional health literacy		Other significant demographic variables
	Total group *N* (%)	Unadjusted odds ratio (95% CI)	Adjusted odds ratio (95% CI)	Total group *N* (%)
Ever had a mammogram	85 (88%)	1.03 (0.97–1.08)	1.14 (1.02–1.27)*	Age: 1.24 (1.09–1.41)
Had last mammogram with 1 year	59 (69%)	1.01 (0.97–1.05)	1.01 (0.95–1.08)	Age: 1.08 (1.00–1.16)
Had last mammogram with 2 years	71 (84%)	1.00 (0.95–1.05)	0.98 (0.91–1.07)	No insurance: 0.17 (0.04–0.75)
Had mammogram as part of check-up	64 (77%)	0.96 (0.92–1.01)	1.01 (0.94–1.08)	Age: 1.11 (1.02–1.21)
Check own breasts for lumps	75 (77%)	0.97 (0.92–1.01)	0.95 (0.89–1.01)	
Perform self-breast exams at least monthly	56 (58%)	0.99 (0.96–1.03)	1.01 (0.96–1.06)	

*Significant association, the 95% CI does include 1.00.

that if one found breast cancer early, the chances of cure were "good" or "very good" rather than "OK," "poor," or "very poor" (OR 3.14, 95% CI 1.12–8.81). Puerto Rican women were less likely to be concerned at any level than to be "not at all" concerned about the cost of a mammogram (OR 0.36, 95% CI 0.15–0.87). Puerto Rican women also were more likely than non–Puerto Rican women to have ever had a mammogram (OR 6.81, 95% CI 1.70–27.22). Importantly, however, none of these differences were significant in analyses that adjusted for insurance status.

Discussion

In this study, 88% of the sample had ever had a mammogram and 84% had had a mammogram in the previous 2 years. This compares favorably with the most recent estimates from the National Health Interview Survey, which revealed that 60% of Latinas have had a mammogram in the previous 2 years.[4] This study also demonstrates that low health literacy is a significant problem among Latinas, with 70% of Latinas having a STOFHLA score in the inadequate or marginal functional

Table 5.

INFLUENCES ON DECISION TO HAVE A MAMMOGRAM AND FUNCTIONAL HEALTH LITERACY

		Functional health literacy		Other significant demographic variables
	Total group *N* (%)	Unadjusted odds ratio (95% CI)	Adjusted odds ratio (95% CI)	Total group *N* (%)
Someone has said you should have a mammogram	83(86%)	1.02 (0.97–1.08)	1.10 (1.00–1.20)	Age: 1.13 (1.03–1.25)
Doctor said you should have a mammogram	63(81%)	1.11 (1.03–1.18)*	1.09 (0.99–1.20)	Age: 0.91 (0.83–0.99) No insurance: 0.05 (0.01–0.35)
Learned about mammogram from doctor	52(55%)	1.05 (1.01–1.09)*	1.06 (1.00–1.12)	
If doctor recommended mammogram as part of check-up likelihood of getting one would be "for sure" or "probably" vs. "not at all," "probably not" or "maybe"	87(90%)	1.02 (0.96–1.08)	1.07 (0.97–1.17)	
If doctor said you might have cancer would likelihood of getting one would be "for sure" or "probably" vs. "not at all," "probably not" or "maybe"	93(96%)	1.20 (1.00–1.43)	1.24 (1.02–1.50)*	

(continued)

Table 5. Continued.

If relative recommended mammogram likelihood of getting one would be "for sure" or "probably" vs. "not at all," "probably no" to "maybe"	72(74%)	1.02 (0.98–1.06)	1.06 (0.99–1.13)	
If friend recommended mammogram likelihood of getting one would be "for sure" or "probably" vs. "not at all," "probably not" to "maybe"	72(74%)	1.01 (0.97–1.06)	1.05 (0.99–1.12)	Acculturation: 0.21 (0.07–0.69)

*Significant association, the 95% CI does not cross 1.00.

health literacy range. However, after adjusting for potential confounders, functional health literacy was only weakly associated with knowledge about the recommended interval of screening mammography. In addition, functional health literacy was not associated with beliefs or attitudes about, but was significantly associated with ever having had, a mammogram.

These results differ from those of a similar study of low-income, low-literacy African-American and non-Hispanic white women that demonstrated that lower health literacy skills were associated with less knowledge and more negative attitudes about mammography.[23] However, a major difference between the women in the two studies was socioeconomic status. Whereas 83% of the women had an income of under $10,000 in the previous study, only 47% of the women in our study had an income of under $10,000. The difference in income may be a proxy for the socioeconomic differences that correlate with differences in knowledge, beliefs, and attitudes about mammography. In addition, there may be cultural and/or other differences that make Latinas more aware of mammography and lead them to have more positive beliefs and attitudes toward mammography. Finally, these two studies differed in the instruments used to measure health literacy. The non-Latina study used the Rapid Estimate of Adult Literacy in Medicine (REALM), which is a health literacy assessment instrument that relies on word recognition and pronunciation,

and the current study used the STOFHLA, an instrument that relies on reading comprehension.

The finding that functional health literacy was associated with behavior related to ever having had a mammogram suggests that health literacy is a barrier to undergoing mammography screening. This was previously suggested by a study of Medicare enrollees that showed that, after adjusting for socioeconomic variables and health status, older adults with inadequate functional health literacy were less likely than adults with adequate health literacy to have had a mammogram in the past 2 years.[24] Only a minority (12%) of patients in the Medicare study were of Latino ethnicity and the mean age of respondents was 71 years of age; thus, this study further demonstrates the generalizability of these findings to a younger sample of Latinas.

Subgroup analysis of the Puerto Rican women shows that they are generally not different in demographic characteristics from the broader Latina population other than being more likely to possess insurance, which is consistent with data from previous National Health Interview Surveys.[21] The few differences that were observed in knowledge, beliefs, attitudes, and behavior disappeared when adjusting for insurance status.

One limitation of the current study is that our sample was limited to a convenience sample of a small number of women attending community clinics and, thus, the findings may not be generalizable to women without health care or to the broader Latina population. Finally, we used self-report to ascertain mammography status, leaving some uncertainty about actual rates of mammography in this sample. However, previous studies have shown that self-report is a valid method of collecting mammography data.[31–33] Nonetheless, this study has important implications for low health literacy populations. When viewed in the context of previous studies, this study shows that there is heterogeneity in the level of knowledge, beliefs, and attitudes about preventive services within low health literacy populations, but is consistent in demonstrating that patients with low functional health literacy skills are less likely to undergo preventive screening tests. Future studies should target increasing rates of screening behaviors in patients with low functional health literacy. Interventions that rely less on print than on other types of media, such as a multimedia breast education kiosk,[34] which has been shown to be effective in increasing mammography screening in low-income Latinas, are most likely to benefit Latinas with limited health literacy.

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Notes

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