Poor Patient Comprehension of Abnormal Mammography Results

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BACKGROUND: Screening mammography for women 50 to 69 years of age may lead to 50% having an abnormal study. We set out to determine the proportion of women who understand their abnormal mammogram results and the factors that predict understanding.

METHODS: We surveyed 970 women age 40 to 80 years identified with abnormal mammograms from 4 clinical sites. We collected information on demographic factors, language of interview, consultation with a primary care physician, receipt of follow-up tests, and method of notification of index mammogram result. This study examines the following outcomes: the participant's report of understanding of her physician's explanation of results of the index mammogram, and a comparison of the radiology report to the participant's report of her index mammogram result. Multivariate models controlled for age, education, income, insurance status, and clinical site.

RESULTS: The majority (70%) reported a "full understanding" of their physician's explanation of their abnormal mammogram, but a significant minority (30%) reported less than a full understanding (somewhat, not at all, did not explain). Among women of Asian ethnicity, only 63% reported full understanding. Asian ethnicity was a negative predictor (odds ratio [OR], 0.4; 95% confidence interval [CI], 0.3 to 0.7), and consultation with a primary care physician was a positive predictor (OR, 2.3; 95% CI, 1.7 to 3.3) of reported full understanding. Of the 304 women with a suspicious abnormality, only 51% understood their result to be abnormal. Women notified in person or by telephone were more likely than women notified in writing to understand their result to be abnormal (OR, 2.3; 95% CI, 1.2 to 4.8).

CONCLUSION: Almost half of women with the most suspicious mammograms did not understand that their result was abnormal. Our data suggest that direct communication with a clinician in person or by phone improves comprehension.

R outine mammogram screening for breast cancer every 2 years may lead to 50% of women having an abnormal study after 10 years.[1] Although most abnormal studies will turn out to be false positives, a significant proportion will be associated with carcinoma,[2–5] and all abnormalities require prompt follow-up care. A recent study found that among African-American women with abnormal mammography, those who reported receiving clear information about next steps are 2.5 times more likely to complete appropriate follow-up in a timely manner.[6] The need for clear communication of an abnormal result and appropriate follow-up is imperative. Yet, it is unclear how well clinicians communicate or patients understand their abnormal mammogram results and the need for follow-up.

This communication may be complicated by cultural and language differences between physicians and their patients. In addition to the access, knowledge, and multiple other known barriers to cancer screening which may disproportionately affect an immigrant population,[7–10] it has been shown that among Latina and Asian women, having limited English proficiency (LEP) and being less acculturated are barriers to receiving breast cancer screening.[11–15] There is some evidence that Latina and Asian women with abnormal mammogram results are more likely than non-Latina whites to report receiving confusing or contradictory information about the mammogram results.[16] However, it is unclear to what extent ethnicity or LEP are barriers to comprehension of screening mammography results. This study examines ethnicity, language, physician factors, and mammography factors as predictors of women's comprehension of their abnormal mammogram results. Other analyses of these data have examined the role of risk factors for breast cancer in evaluating abnormal mammograms[17] and the association of depressive and level abnormality.[18]

METHODS

Setting, Sample Selection, and Eligibility

A cross-sectional telephone survey in a sample of women identified with abnormal mammograms was completed. Women were identified from the following clinical sites in the San Francisco Bay area: 1 academic institution, 4 sites from 1 group model health plan, 1 inner-city public hospital, and 1 community hospital. Women were eligible if they were between age 40 and 80 years; self-identified as African American, Asian, Latina, or white; spoke English, Spanish, Cantonese, or Mandarin; and had an index abnormal mammogram. Abnormal mammography was defined by the American College of Radiology Breast Imaging Reporting and Data System (BI-RADS) category of "0" for indeterminate study, "3" for probably benign, "4" for suspicious of malignancy, or "5" for highly suggestive of malignancy.[19] The study was designed with the intention of recruiting similar proportions of women in each ethnic group and not as a random sample of women with abnormal studies. Women with a previous diagnosis of cancer in the same breast with the identified abnormality were excluded. The study protocol was reviewed and approved by the Institutional Review Board of each clinical site from which participants were recruited.

Study Procedures

After physicians consented to contacting their patients, women were sent an initial contact letter describing the study and requesting participation with the option to opt out of further contact by mailing back a postcard. Research assistants called potential participants to inquire about participation and women who agreed were consented for their participation verbally over the telephone in their preferred language after explanation of the study. If the participant had not been informed of the result of the mammogram, she was asked to consult with the physician who had ordered the study. The baseline survey was conducted by telephone from November 1999 through December 2001. Women were interviewed on average 6 months after the index mammogram (median 26 weeks, range 4 to 86), with 92% of the interviews completed less than 12 months after the index mammogram. The questionnaire consisted of 142 items and took on average 38 minutes to complete. Interviews were conducted according to each woman's language preference.

Measures: Demographic, Physician-related, and Mammography Factors

Demographic factors included ethnicity by self-report, language of interview, and language acculturation scale (for the women interviewed in a non-English language).[20] Age, level of education, income, and health insurance status (no insurance, Medicare/Medi-Cal, group model health plan, or other private insurance) were also obtained. Physician-related factors included consultation with a primary care physician about the index mammogram or breast concerns, ethnic concordance of patient and physician, and participant's report of method of first notification of the mammogram result. The method of notification variable was collapsed into two categories: written communication and verbal communication (in person or by telephone).

Mammography and breast factor variables included the participant's self-report of the mammogram result, receipt of follow-up tests, as well as the radiology report of the index mammogram. Based on the BI-RADS classification, a 3-category indicator was created. An incomplete study was termed "indeterminate" and categories 4 and 5 were combined. Thus, the 3 variables included the categories of "probably benign," "indeterminate," and "suspicious/highly suggestive of malignancy." The participant's report of her mammography abnormality was derived from a question in which she was asked, "What was the result of your mammogram done on (specific date)?" and was given the choices of "normal," "normal but had to go for more tests," "abnormal," and "don't know." Each participant was also asked about follow-up tests, specifically whether or not she had an additional mammogram, a breast ultrasound, or a breast biopsy. If she answered "yes" to any one of these 3 questions, she was considered to have had a follow-up test.

Measures: Indicators of Comprehension

We identified 2 outcome variables as indicators of comprehension. The first variable measured overall comprehension of the mammogram result as explained by the woman's physician. Participants were asked, "How well did you understand your doctor's explanation about the results of your mammogram?" Response categories were "fully understood," "somewhat understood," "did not understand at all," or "did not explain results." This variable was dichotomized into "full understanding" and "less than full understanding." This outcome was analyzed for the full sample.

The second comprehension variable was defined by concordance of the BI-RADS category and the woman's response to the question about the result of the index mammography. Women who had a BI-RADS category 4 or 5 mammogram interpretation (suspicious/highly suggestive of malignancy) were considered concordant when the participant reported having an "abnormal" result and this concordance was defined as "adequate" comprehension. If she reported having a "normal" or "normal, but needed more tests" result it was considered reflecting "inadequate" comprehension. Women who had a result of mammography interpretation BI-RADS category 3 (probably benign) or BI-RADS category 0 (indeterminate) were considered concordant if the participant reported having a "normal, but needed more tests" or an "abnormal" result and this was defined as "adequate" comprehension. If she reported having a "normal" result, it was considered "inadequate" comprehension.

Data Analysis

Data were analyzed using the SAS statistical package, version 8 (SAS Institute, Cary, NC)[21] and the Stata statistical package, version 7 (Stata Corporation, College Station, TX).[22] We performed descriptive statistics and bivariate analysis of the entire sample, comparing those who reported full understanding and those who reported less than full understanding of their doctor's explanation of their mammogram. Categorical predictors were evaluated using χ^2 tests, and continuous predictors were evaluated using t tests. A P value $<.05$ was considered significant. Odds ratios different from 1 with a 95% confidence interval that did not cross 1 were considered significant. Additionally, we performed 3 multivariate logistic regression analyses. Ethnicity (white as the reference group) and language of interview (English as the reference group) were always included as the predictors of primary interest. Predictors that had significant P values or significant unadjusted odds ratios were included in the models. Method of notification was included for face validity regardless of its statistical significance. Age, education, income, insurance status, and clinic/hospital site were included in all 3 models.

The first multivariate model evaluated the effect of ethnicity, language of interview, level of mammography abnormality, consultation with a primary care physician, method of notification, and self-report of follow-up tests on the woman's self-reported full understanding of her physician's explanation of her mammogram results. The second multivariate model evaluated the effect of ethnicity, language of interview, method of notification, and self-report of follow-up on the understanding women had that the BI-RADS category 4 or 5 result was "abnormal." The third multivariate logistic model evaluated the effect of ethnicity, language of interview, method of notification, and self-report of follow-up tests on the woman's understanding that her BI-RADS category 3 or category 0 result was not "normal." All 3 models adjusted for age, education, income, insurance status, and clinic/hospital site.

Last, descriptive statistics were performed on the survey responses to questions about their method of communication with their doctor from women interviewed in a non-English language. Because the number of women responding to these questions was small compared to the full sample, limiting the power to find any associations, these responses were not included in the aforementioned analyses.

RESULTS

Recruitment

A total of 3,270 women were identified at the clinical sites as having an abnormal mammogram during the recruitment period. Despite up to 10 telephone calls, 1,250 women were unable to be contacted. An additional 818 were either found to be ineligible to participate or their physician declined the study's request to contact them. Thirteen women participated in interviews in which the instrument was pretested. A total of 1,715 women were contacted for the study and 970 (57%) completed the survey. The group of 745 nonparticipants did not differ from the participants in distribution of mammography abnormalities by BI-RADS categories (P=.6). Women who declined to participate were older at the time of their index mammogram (mean age, 57 vs 55; P=.0006), and less likely to have been recruited from the public hospital site (4% vs 8%; P=.0002).

PATIENT CHARACTERISTICS

Table 1 shows characteristics of this sample of 970 women with abnormal mammograms. Women interviewed in a language other than English had a mean score of 1.3 (standard deviation ± 0.52) on a 5-point language acculturation scale, indicating a low level of acculturation. Of both Chinese and Spanish speakers, 62% reported speaking only in Chinese or Spanish with their doctor, but only 53% reported that their doctor speaks their native language very well or excellently. In addition, only 56% reported ever having an interpreter present

Table 1. Demographic Description of Women with Abnormal Mammography, San Francisco Bay Area, 1999–2001 (N=970)

Total	n (%)
Age, y (mean, 56.1 ± 10.3)	
40–49	314 (32.4)
50–64	437 (45.1)
65–80	219 (22.6)
Ethnicity	
White	407 (42.0)
African-American	240 (24.7)
Latina	181 (18.7)
Asian	142 (14.6)
Language of interview	
English	824 (85.0)
Chinese	47 (4.8)
Spanish	99 (10.2)
Level of education	
Less than high school	138 (14.3)
High school graduate	482 (49.8)
College graduate	348 (35.9)
Health insurance status	
No insurance	48 (5.0)
Medicare/Medi-Cal	72 (7.4)
Group model health plan	659 (68.2)
Other private insurance	187 (19.4)

when they see their doctor. The type of interpreter was distributed among family members (35%), office employees (37%), and professional interpreters (28%).

Physicians/Mammography Factors

Physician-related and mammography-related factors for the sample are described in Table 2. More than one third reported having a physician of the same ethnicity as herself, while the vast majority reported no preference for a physician of the same ethnicity or that it did not matter. Approximately half of the women reported consulting with their primary care physician. More than one third of all participants believed their mammography result to be normal, despite the fact that everyone in the sample had an abnormal finding. Approximately one third had mammogram results suspicious for or highly suggestive of malignancy (BI-RADS category of 4 or 5).

Women with BI-RADS 4 or 5 index mammography results had a high overall follow-up testing rate by self-report (96%); however, this rate differed according to the woman's report of her mammography result. The rate was highest for those women reporting the result as "abnormal," and the lowest for those women reporting the result as "don't know" (99% vs 80%; P<.0001). The follow-up rate by self-report was also significantly lower for those reporting "normal" as compared to those

Table 2. Physician and Mammography Factors for 970 Women with Abnormal Mammography, San Francisco Bay Area, 1999–2001

	n (%)
Physician Factors	
Ethnic concordance with physician	350 (36.1)
Preference for doctor of same ethnicity	165 (17.0)
Method of notification of result	
In writing	402 (41.9)
In person/phone by primary MD	135 (14.1)
In person/phone by other MD or NP	220 (22.9)
In person/phone by non-MD/NP staff	142 (14.8)
Can't tell who or how	60 (6.3)
Participant's understanding of physician explanation of the mammogram result	
Full	675 (69.6)
Somewhat	133 (13.7)
Not at all	19 (2.0)
Did not explain	136 (14.0)
Don't know	7 (0.7)
Consulted with primary MD about mammogram	533 (55.0)
Clinical sites	
Academic health center	187 (19.3)
Group model health plan sites	657 (67.7)
Private community hospital	81 (8.4)
Public hospital	45 (4.6)
Mammography/Breast Factors	
Participant's report of abnormality	
Normal	395 (40.7)
Normal, but needed more tests	217 (22.4)
Abnormal	324 (33.4)
Don't know	34 (3.5)
Radiology report—BI-RADS classification	
Probably benign (3)	519 (53.5)
Indeterminate (0)	147 (15.2)
Suspicious/highly suggestive of malignancy (4/5)	304 (31.3)
Participant self-report of any follow-up test (mammogram, ultrasound, and/or biopsy)	765 (78.9)

NP, Nurse Practitioner; BI-RADS, Breast Imaging Reporting and Data System.

Table 3. Percent and Adjusted Odds of Participants Reporting Full Understanding of Physician's Explanation of the Mammogram Result (N=970)*

Predictor	Fully Understood n (% Total Sample)	Adjusted OR (95% CI)
Ethnicity		
White	293 (72.0)	reference
African-American	174 (72.5)	1.2 (0.8 to 1.9)
Latina	119 (65.8)	0.8 (0.4 to 1.3)
Asian	89 (62.7)	0.4 (0.3 to 0.7)
Language of interview		
English	580 (70.4)	reference
Non-English	95 (65.1)	1.8 (0.9 to 3.3)
Consulted with primary physician		
No	255 (58.4)	reference
Yes	420 (78.8)	2.3 (1.7 to 3.2)
Method of notification		
In writing	258 (64.2)	reference
In person or by telephone	371 (74.7)	1.2 (0.9 to 1.7)
Radiology report—BI-RADS classification		
Probably benign (3)	325 (62.6)	reference
Indeterminate (0)	117 (79.6)	2.4 (1.2 to 4.9)
Suspicious/highly suggestive of malignancy (4/5)	233 (76.6)	1.4 (0.9 to 2.1)
Participant self-report of any follow-up tests (mammogram, ultrasound, and/or biopsy)		
No	124 (60.5)	reference
Yes	551 (72.0)	1.1 (0.8 to 1.7)

*Multivariate model includes the above predictors, controlling for age, education, income, insurance status, and clinical site.
OR, odds ratio; CI, confidence interval; BI-RADS, Breast Imaging Reporting and Data System.

Table 4. Percent and Adjusted Odds of Participants' Understanding That Their Suspicious or Highly Suggestive of Malignancy (BI-RADS 4 or 5) Mammogram Was Abnormal (N=304)*

Predictor	Understood the Mammogram Was Abnormal n (%) of Total	Adjusted OR (95% CI)
Participant with BI-RADS 4 or 5 report of mammogram result		
Abnormal	156 (51.3)	
Normal, but needed more tests	23 (7.6)	
Normal	115 (37.8)	
Don't know	10 (3.3)	
Ethnicity		
White	84 (51.5)	reference
African-American	37 (52.1)	1.2 (0.6 to 2.3)
Latina	15 (51.7)	1.4 (0.5 to 4.0)
Asian	20 (48.8)	1.0 (0.4 to 2.3)
Language of interview		
English	144 (52.0)	reference
Non-English	12 (44.4)	0.6 (0.2 to 2.1)
Method of notification		
In writing	22 (38.6)	reference
In person or by telephone	125 (56.0)	2.3 (1.2 to 4.8)
Participant self-report of any follow-up tests (mammogram, ultrasound, and/or biopsy)		
No	2 (15.4)	reference
Yes	154 (52.9)	11.9 (1.1 to 127.8)

*Multivariate model includes the above predictors, controlling for age, education, income, insurance status, and clinical site.
OR, odds ratio; CI, confidence interval; BI-RADS, Breast Imaging Reporting and Data System.

reporting "abnormal" (99% vs 93%; *P*=.01), but there was no significant difference for the women who reported their results to be "normal, but needed more tests" (99% vs 96%; *P*=.29).

Full Understanding

While 70% of the sample reported full understanding of their physician's explanation of their mammogram, 30% reported less than full understanding, and there were some differences by ethnicity and language of interview (Table 3). English-speaking Latinas and Asians, and women interviewed in a language other than English, were all less likely to report full understanding, with Chinese-speaking Asian women being the least likely to report full understanding compared with whites and African Americans. However, this difference was only statistically significant for Chinese-speaking Asian women (58% vs 72%; *P*=.04). Women who had consulted with a primary care physician versus those who did not (79% vs 58%; *P*<.001), who were notified about their results in person or by telephone versus those notified in writing (75% vs 64%; *P*=.001), or who reported having any follow-up tests versus those who did not (72% vs 61%; *P*=.001) were all more likely to report full understanding in bivariate comparisons. Women with a mammography BI-RADS classification of indeterminate (80% vs 63%; *P*=.01) or suspicious/highly suggestive of malignancy (77% vs 63%; *P*=.04) were also more likely than those with a classification of probably benign to report full understanding. There was no association between the time from a woman's index mammogram to her baseline survey with her report of full understanding. In multivariate analyses, adjusting for age, education, income, insurance status, and clinic/

hospital site, Asian ethnicity remained a strong negative predictor of full understanding. Consultation with a primary care physician and an indeterminate BI-RADS classification remained strong positive predictors of full understanding.

Concordance of Woman's Report and BI-RADS Category

Of the 304 women with a classification of suspicious or highly suggestive of malignancy (BI-RADS 4/5), almost half (49%) were unaware that their mammogram result was abnormal (Table 4). Only 156 reported that their mammogram result was "abnormal," and 115 actually reported that their mammogram result was "normal." Ethnicity and language of interview were not associated with women understanding their abnormal results. Women who were notified in person or by telephone and those who reported having had any follow-up tests were more likely to have adequate comprehension that their mammogram was abnormal. This was true in both the bivariate and adjusted multivariate analyses. There was no association between the women's time from their index mammogram to their baseline survey with their understanding their abnormal results.

Mammogram results were "abnormal, probably benign" (BI-RADS 3) or "indeterminate" (BI-RADS 0) in 666 women. Of these, 54% reported that their results were "normal, but needed more tests" or "abnormal," 42% reported that their results were "normal," and 4% did not know what their results were (Table 5). African-American and white women were least likely to understand that their mammogram was not normal. Women who reported having had any follow-up tests were more likely than those who did not to understand that their result was not

Table 5. Percent and Multivariate Odds of Participants' Understanding That Their Abnormal, Probably Benign, or Indeterminate Mammogram (BI-RADS 3 or 0) Was Not Normal (*N*=666)

Predictor	Understood the Mammogram Was Not Normal N (%) of Total	Adjusted OR (95% CI)
Participants with BI-RADS 0 or 3 report of mammogram result		
Normal but needed more tests or abnormal	362 (54.4)	
Normal	280 (42.0)	
Don't know	24 (3.6)	
Ethnicity		
White	126 (51.6)	reference
African-American	85 (50.3)	0.7 (0.5 to 1.2)
Latina	94 (61.8)	2.1 (1.1 to 3.8)
Asian	57 (56.4)	1.8 (1.0 to 3.2)
Language of interview		
English	294 (53.7)	reference
Non-English	68 (57.1)	0.7 (0.3 to 1.4)
Method of notification		
In writing	179 (51.9)	reference
In person or by telephone	159 (58.0)	1.2 (0.8 to 1.7)
Participant self-report of any follow-up tests (mammogram, ultrasound, and/or biopsy)		
No	90 (46.9)	reference
Yes	272 (57.4)	1.5 (1.0 to 2.3)

Multivariate model includes the above predictors, controlling for age, education, income, insurance status, and clinic/hospital site.
OR, odds ratio; CI, confidence interval; BI-RADS, Breast Imaging Reporting and Data System.

normal (57% vs 47%; *P*=.01). There was no association between the women's time from their index mammogram to their baseline survey with their understanding that their mammogram was not normal. In the adjusted multivariate model, Latina ethnicity was associated with an increased likelihood of adequate comprehension that the results were not completely normal; there was a trend toward a similar association for women of Asian ethnicity. Additionally, having had follow-up tests was positively predictive of adequate comprehension. The participant's ethnic concordance with her physician was not significant on bivariate analyses with any of the 3 comprehension measures. Addition of this covariate to the multivariate models did not alter any of the models' results.

DISCUSSION

The most striking finding of this study is that only about a third of the respondents reported that their mammography test was abnormal. Some of this misunderstanding may be due to the fact that 54% of the women had a "probably benign" category result, and that the false positive results were efficiently addressed with a normal follow-up test. These women's physicians may well have reassured them that the initial mammogram really was normal. However, nearly half of the sample had a suspicious mammogram or an indeterminate examination, and about a quarter of these women did not report full understanding of their physician's explanation.

Overall, 70% of women reported full understanding of their physician's explanation of the abnormal mammogram. Asian women compared to white women were less likely to report full understanding. The reason for this may in part be due to language differences with their physicians. Although women interviewed in Spanish or Chinese in general did not have a lower odds of full understanding, Asian women interviewed in Chinese were the group least likely to report full understanding. In contrast, Latinas interviewed in Spanish were only slightly less likely to report full understanding than were white and African-American women. This difference may be due to the relative availability of Spanish-speaking doctors compared to that of Chinese-speaking doctors in the San Francisco Bay area.[23] There may also be unexplored cultural differences between Asian women and their physicians that interfere with effective communication. However, we did find that, regardless of ethnicity or language of interview, women who consulted their primary care physician about their mammogram had twice the odds of reporting full understanding. This supports the role of the primary care physician as not simply a "gatekeeper," but as playing a key role as coordinator in patients' comprehension of their health status and decision making.[24] This is consistent with prior research in which women who reported that their physician explained further tests in a way they could understand were more likely to have appropriate follow-up care.[25]

We were able to further evaluate comprehension of the mammography result by comparing the interpretation of the mammogram with the woman's self-report of the result. Among women with the most suspicious results, nearly half of these women did not understand that their mammogram was abnormal. Unfortunately, these are the women for whom comprehension of their result and ensuing follow-up is most important, because they are at the highest risk for breast cancer.[5,26] The only factor predictive of improved comprehension that their mammogram was abnormal was having been notified verbally, either in person or by telephone, of their mammogram results. This is consistent with other studies showing that if an abnormality is found, women prefer to be told directly, either by their own physician or by the radiologist reading the mammogram.[27–29] Analyses of women who had a probably benign or indeterminate result (BI-RADS category 3 and 0) also showed less than optimal understanding. Although these women had abnormal mammograms, they are at much lower risk of having breast cancer than women with suspicious findings.[5,25] However, it is important that each of these women understands that her result was abnormal and that she needs to follow up, because up to 5% of women in this group will have cancer.[5] Again, nearly half of these women did not understand that their mammogram was not normal. Although we are unable to determine why these women would be less likely to understand, it is possible that physicians are telling them something different. Receipt of follow-up tests improved comprehension in this subset of women, regardless of ethnicity or language, possibly because these women were able to identify the option "normal, but needed more tests" as the appropriate one. Overall, women with a "probably benign" or "indeterminate" diagnosis on mammography may be better off considering their result as "normal, but needed more tests" and not have the anxiety of a possible diagnosis of cancer. In practice, physicians may well be communicating this to patients.

Among the limitations of this study is that most of the measures, including the measure for comprehension used for the entire sample, are by self-report. In part to address this, 2 measures of comprehension were created for the study population. Both of these measures were created by concordance

between an objective measurement (BI-RADS category) and the woman's self-report of the result. This allowed for a more objective measurement of the woman's true comprehension. Because the receipt of follow-up tests was also based on self-report, it is possible that not everyone who received follow-up testing was captured. However, because the median time to the interview from the baseline mammogram was 6 months, it is probable that the survey captured most women who had follow-up testing. Additionally, many of these women may have already had diagnostic resolution of the abnormal finding at the time of their baseline survey. In the case of false positive results, particularly for the women with "probably benign" (BI-RADS 3) or "indeterminate" (BI-RADS 0) results, this may have led them to underestimate the severity of their initial results especially if the only follow-up test was additional mammography. To address this potential recall bias, we accepted an answer of "normal, but needed more tests" as adequate comprehension for these women. Another limitation is that we had no standard measurement of English proficiency; however, it is clear that women interviewed in Spanish and Chinese scored low on a language acculturation scale, indicating that they probably are of limited English proficiency.

In conclusion, the results of this study show that although the majority of women with abnormal mammograms report a full understanding of their doctor's explanation of that mammogram, almost half of all participants with extremely abnormal mammograms do not understand that their result is abnormal. This is very concerning as understanding that a test is abnormal and needs follow-up enhances receipt of clinically appropriate follow-up and treatment.[6,24] Future studies are needed to focus on ways to increase women's comprehension of their tests and promote receipt of appropriate and prompt follow-up tests and clinical care. Our data support both the role of primary care doctors in communication of abnormal mammogram results as well as that of direct verbal communication of those results.

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