ASSESSING SCREENING MAMMOGRAPHY UTILIZATION IN AN URBAN AREA

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This study was conducted to determine the predictors of screening mammography among women 40 years old and older residing in South Central Los Angeles, California. The population is predominately African American and Hispanic. Using Computer Assisted Telephone Interview (CATI) software and the Random Digit Dialing (RDD) method, a 54-item, 20-min questionnaire was administered to 505 women. All interviews were conducted in English or Spanish. The Health Belief Model provided the conceptual framework for the design of the questionnaire. A majority (81.8%) of the participants reported having at least one mammogram in their lifetime, with African Americans reporting the lowest rate (74.7%). Multiple logistic regression analyses found that 4 of the 23 independent variables assessed were predictive of *ever users* of mammography ($p < 0.05$), while 6 independent variables were predictive of *never users* of mammography ($p < 0.05$). A significant finding of this study is the lower rate of screening mammography utilization in this sample compared to estimates for the general population. The results of this study also suggest that substantial improvements in the rate of screening mammography could be achieved if women in their 40s, who are without health insurance, were referred by their physicians to have affordable mammograms every year or two. (*J Natl Med Assoc.* 2002; 94:5–14.)

Key words: mammography ♦ screening ♦ urban areas

Both men and women contract breast cancer; however, according to statistics compiled by the American Cancer Society, 99% of the cases and deaths occur among women.[1] Breast cancer is the most frequently occurring cancer among women with an estimated 192,200 new invasive cases and 40,200 deaths expected in 2001.[1]

Breast self-examinations, clinical breast examinations and screening mammograms continue to be the primary tools for the early detection of breast cancer among asymptomatic women. The American Cancer Society Board of Directors voted on March 23,1997 to change the Society's breast cancer detection guidelines to include yearly screening mammography for all women 40 years of age and older. It is encouraging to note the recent trend toward increasing use of screening mammography among women 40 years old and older. The total age-adjusted proportion of women in this age group who reported ever having a mammogram increased from 63.9% in 1989 to 84.8% in 1997.[2] For the same

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period, the proportion of women who reported that their most recent mammogram was for screening increased from 53.1% to 76.9%.[2] The same report indicates that in 1997, 71.3% of women reported receiving a mammogram within the previous 2 years. However, this means that despite the enormous improvement in the use of screening mammography and the documented value of this tool, many women still are not taking advantage of this potentially life-saving procedure as recommended by the American Cancer Society.

Historically, health-screening procedures have been under-utilized by low-income, minority, and inner-city women.[3–10] Although recent findings among ethnic/racial groups suggest that relative utilization of mammograms is changing, at least among African Americans, there are certain segments of the population that are still experiencing very low screening rates.[2] For example, a local study in Los Angeles indicated that only about 20% of low-income minority women received a screening mammogram according to the guidelines for their age.[11] Consequently, it is critical that all segments of the population be informed of the life-saving potential of screening mammograms and that they be encouraged to get mammograms according to current health care standards.

The objectives of this study are to examine the characteristics of a randomly selected sample of women 40 years old or older residing in an urban inner city area and to assess the predictors of them getting screening mammograms.

The King/Drew service area is an economically disadvantaged, medically under-served, inner-city community of predominately Hispanic and African-American residents. The area is located in the Watts-Willowbrook section of South Central Los Angeles. The King/Drew Medical Center is the result of a 30-year-old affiliation agreement between the Los Angeles County-owned Martin Luther King, Jr., General Hospital and the private, nonprofit Charles R. Drew University of Medicine and Science. The Medical Center is the primary provider of health services for the 1.8 million residents (59.1% Hispanic; 27.8% African American; 8.7% white; 4.1% Asian/Pacific Islander (API); and 0.3% others) in the area. Drew University is the only historically African-American medical school west of the Mississippi River.

METHODS

Data for this population-based survey was collected in 1997–1998 using the Computer Assisted Telephone Interview (CATI) software and the Random Digit Dialing (RDD) method. CATI provides immediate on-line editing of all responses and automatic skipping of questions depending on responses. This reduces interviewer error and produces a clean data file immediately as the data are entered. At least 5% of all interviews were monitored for quality control. The majority of calls were made between the hours of 4 p.m. and 9 p.m. Monday through Friday and between 10 a.m. and 4 p.m. on Saturday and Sunday. Up to 10 call attempts were made to obtain a response for each telephone number in the sample.

All interviews were conducted in either English or Spanish. A total of 6443 telephone numbers were called, resulting in contacts with 1240 (19.2%) respondents eligible to participate in the study. Of these, 707 refused to participate and 28 women began the interview and terminated it before completion, resulting in a 59.3% (735/1240) refusal rate. Conversely, a total of 505 (40.7%) of those contacted voluntarily agreed and completed the 20-min interview.

The survey instrument for this study consisted of a 54-item questionnaire designed to assess demographic characteristics, history of mammography use, knowledge, attitudes and behaviors regarding mammography (see Table 1). The majority of the items were adopted from Bastani and colleagues[12,13] and the National Cancer Institute's Breast Cancer Consortium.[14] The Health Belief Model (HBM) provided the conceptual framework for the design of the questionnaire.[15] This model proposes that a variety of factors have an impact on an individual's decision about behavior changes. These factors include perceived susceptibility to the condition in question, belief about the severity of the condition, perceived benefits of the health behavior vs. the cost of engaging in the behavior, and perceived barriers to the behavior. The validity and reliability of HBM constructs have been documented in a wide variety of areas, including cancer screening.[12,13,16–19]

Perceived susceptibility is a composite measure of three items listed in Table 1 on a Likert type scale. They were measured with the response categories of 1 (*all the time*), 2 (*some of the time*), and 3 (*never*). The possible scores ranged between 3 and 9, where 3

Table 1. Survey Data Collected

- Demographics: age, race, marital status, education, income, insurance, method of payment for the last mammogram.
- Knowledge of screening guidelines: At what age should a woman begin having regular mammograms? How often should a woman your age get a mammogram if no symptoms of breast problems are present?
- Mammography history: within the last 12 months, 1–2 years ago, 3 or more years ago.
- Number of mammograms ever had: one, two, three or more, or none.
- Reasons for the last mammogram: screening or diagnostic.
- Barriers to screening mammogram: cost, fear of exposure to radiation, fear of finding breast cancer, mammogram being painful, embarrassment, inconvenience, and difficulty getting to a clinic or a doctor's office.
- Perceived efficacy of mammogram: accuracy of mammogram in detecting cancer.
- Perceived efficacy of early detection: likelihood of early detection increasing one's chance of survival.
- Perceived susceptibility: How often do you think about the possibility of getting breast cancer? Compared to other women your age, how likely do you think it is that you could get breast cancer? How worried are you about breast cancer compared to other things in your life?
- Perceived severity: How life-threatening do you think breast cancer is?

represents low perceived susceptibility and 9 represents high perceived susceptibility (Range = 3 to 9, Mean = 6.22, SD = 1.60, Cronbach's alpha = 0.55).

Measures of perceived barriers to obtaining mammograms were assessed by seven items also listed in Table 1. Women were asked whether they were *very concerned, somewhat concerned,* or *not concerned* about each of these potential barriers.

Univariate, bivariate, and multiple regression analyses were performed on the database. These analyses were performed to describe respondents' attributes and determine the strength of associations between variables in explaining why women did or did not get screening mammograms within the last 12 months. Respondents' demographics, professional referrals for mammograms, perceptions, resources, and mammography history were among the variables examined (see Table 2).

The interactive effects of a large number of variables in a bivariate analysis can produce specious results. Consequently, a multiple logistic regression analysis was performed to determine the independent predictors of women having a mammography within the last 12 months (see Table 3). Variables were dichotomized in the following manner. Those who responded that it would be *very* or *somewhat inconvenient* for them to take the time to get a mammogram were classified as *Inconvenienced* while all other respondents were classified as *Not Inconvenienced.* Respondents who reported having had *one or two* mammograms were assigned to group one and those having *three or more* were assigned to the second group. Respondents who reported examining their breast at least *once a month or more* were classified as *frequent examiners* while all other respondents were classified as *nonfrequent examiners.* For frequency of clinical breast examinations, those who reported that they have a professional examine their breast *once a year or more* were classified as *frequent examiners* while all other respondents were classified as *nonfrequent examiners.*

RESULTS

The sample consisted of a total of 505 women residing in the King/Drew Medical Center service area who voluntarily consented to the telephone interview. Univariate analysis shows that the samples' mean age was 57.3 years, reflecting the fact that only women 40 years old and older were included. A comparison reported in Table 4 shows that this sample is fairly representative of the residents of the King/Drew Medical Center service area with respect to race/ethnicity, level of education, and median family income.

A majority (81.8%) of the respondents reported having at least one mammogram in their lifetime (see Table 5) with African Americans reporting the lowest rate (74.7%). Of those who reported having a mammogram (413), a vast majority (89.7%) reported that their most recent test was for screening purposes. Nearly half (48.4%) of our sample reported having mammograms in the past 12 months, and an additional 19.4% reported having mammograms within the preceding 24 months.

Bivariate predictors of having a mammogram within the last 12 months are presented in Table 2. Age, income, education, health insurance, payment

Table 2. Characteristics of Women who Reported Having a Mammogram Within the Last 12 Months and Women who Reported Never Having a Mammogram

Characteristics	Ever had a mammogram ≤ 12 month (n = 244)		Never had a mammogram (n = 92)	
	n (%)	P-value	n (%)	P-value
Age		0.000*		0.000*
■ 40–49	91 (39.2)		58 (25.0)	
■ ≥50	152 (56.1)		34 (12.5)	
Race/ethnicity		0.122		0.008*
■ African American	77 (42.3)		46 (23.5)	
■ Hispanics	116 (52.3)		33 (14.9)	
■ Others	51 (50.5)		13 (12.9)	
Marital status		0.131		0.570
■ Married/living as married	137 (51.5)		46 (17.3)	
■ Others	107 (44.8)		46 (19.2)	
Income		0.004*		0.001*
■ <20,000	95 (43.8)		47 (21.7)	
■ ≥20,000	106 (57.6)		18 (9.8)	
Education		0.002*		0.000*
■ ≤8 years	64 (39.0)		44 (26.8)	
■ 9 years to high school	91 (48.1)		33 (17.5)	
■ Some college	89 (58.6)		15 (9.9)	
Health Insurance		0.003*		0.000*
■ Yes	181 (52.3)		41 (11.8)	
■ No	57 (38.0)		49 (32.7)	
Who paid for the last mammogram?		0.045*		
■ Yourself	23 (46.0)		Not applicable	Not applicable
■ Others	221 (60.9)			
Doctor's recommendation		0.000*		0.000*
■ No	71 (37.6)		57 (30.2)	
■ Yes	171 (54.6)		34 (10.9)	
Knowledge of age to begin having regular mammograms		0.346		0.797
■ 40–49	80 (45.5)		31 (17.6)	
■ ≥50	164 (49.8)		61 (18.5)	
Perceived efficacy of early detection		0.338		0.662
■ Very likely	180 (49.2)		65 (17.8)	
■ Somewhat likely	50 (49.5)		18 (17.8)	
■ Not likely	14 (36.8)		9 (23.7)	
Perceived efficacy of mammograms		0.009*		0.002*
■ Very accurate	106 (50.7)		40 (19.1)	
■ Somewhat accurate	111 (51.9)		27 (12.6)	
■ Not accurate	27 (32.9)		25 (30.5)	
Concerned about cost		0.006*		0.017*
■ Very concerned	62 (38.3)		38 (23.5)	
■ Somewhat concerned	38 (56.7)		16 (23.9)	
■ Not concerned	144 (52.2)		38 (13.8)	
Concerned about finding breast cancer		0.526		0.219
■ Very concerned	127 (48.7)		50 (19.2)	
■ Somewhat concerned	60 (51.7)		15 (12.9)	
■ Not concerned	57 (44.5)		27 (21.1)	

(Continued)

Table 2. (Continued)

Characteristics	Ever had a mammogram ≤ 12 month (n = 244)		Never had a mammogram (n = 92)	
	n (%)	P-value	n (%)	P-value
Concerned about embarrassment		0.001*		0.005*
■ Very embarrassed	17 (27.9)		19 (31.1)	
■ Somewhat embarrassed	43 (43.0)		22 (22.0)	
■ Not embarrassed	184 (53.5)		51 (14.8)	
Time inconvenience		0.000*		0.000*
■ Very inconvenient	12 (27.9)		14 (32.6)	
■ Somewhat inconvenient	38 (34.2)		30 (27.0)	
■ Not inconvenient	194 (55.3)		48 (13.7)	
Difficulty getting to a clinic or doctor's office		0.000*		0.000*
■ Very difficult	8 (25.0)		13 (40.6)	
■ Somewhat difficult	24 (29.6)		22 (27.2)	
■ Not difficult	212 (54.1)		57 (14.5)	
Concerned about pain		0.167		0.073
■ Very concerned	55 (42.3)		32 (24.6)	
■ Somewhat concerned	62 (54.4)		16 (14.0)	
■ Not concerned	127 (48.7)		44 (16.9)	
Concerned about exposure to radiation		0.028*		0.000*
■ Very concerned	75 (41.2)		49 (26.9)	
■ Somewhat concerned	70 (56.5)		12 (9.7)	
■ Not concerned	99 (49.7)		31 (15.6)	
Perceived severity of breast cancer		0.276		0.943
■ Very life-threatening	36 (41.9)		15 (17.4)	
■ Somewhat life-threatening	99 (52.1)		36 (18.9)	
■ Not life-threatening	109 (47.6)		41 (17.9)	
Perceived susceptibility†	t = −1.171	0.321	t = 1.387	0.699
Number of mammograms ever had		0.001*	Not applicable	Not applicable
■ One	26 (30.2)			
■ Two	34 (48.6)			
■ Three or more	184 (52.7)			
Frequency of breast self examinations		0.001*		0.033*
■ At least once a month	83 (54.2)		30 (19.6)	
■ 2–3 times a year	92 (55.4)		20 (12.0)	
■ Never/don't know/refused	69 (37.1)		42 (22.6)	
Frequency of clinical breast examinations		0.000*		0.000*
■ Every year	73 (63.5)		18 (15.7)	
■ Every 2 years	142 (54.8)		29 (11.2)	
■ Never/don't know/refused	29 (22.1)		45 (34.4)	

*Statistically significant at $P < .05$.
†Figure is computed for the index of susceptibility.
Note: Percentages are based on slightly different sample sizes due to missing values for some variables.

source, doctor's recommendation, perceived efficacy of mammograms, concerns about cost, embarrassment, inconvenience, difficulty in getting to a clinic or doctor's office, concerns about exposure to radiation, number of mammograms ever had, frequency of breast self-examination, and frequency of

Table 3. Results of the Logistic Regression Analysis, Predicting the Likelihood of Having a Screening Mammogram Within the Last 12 Months (*n* = 244)

Variables	Bivariate	Logistic regression		
	χ^2	β	OR	95% CI
Inconvenience getting to a clinic or doctors office	22.29*	−0.85	0.43	0.26–0.70
Number of mammograms ever had	8.78*	1.15	3.17	1.98–5.07
Frequency of breast self examinations	13.57*	0.47	1.60	0.99–2.57
Frequency of clinical breast examinations	13.70*	0.90	2.46	1.39–4.35

*Statistically significant at $P < 0.05$.

clinical breast examinations were predictive of having a mammogram within the last 12 months.

Only 4 of 23 independent variables examined in a multiple logistic regression were significant ($p < 0.05$). These variables included *inconvenience in getting to a clinic or doctors office; the number of mammograms ever had; the frequency of breast self-examinations;* and *the frequency of clinical breast examinations.*

The results of the multiple regression analysis suggest that women who were concerned about the time it takes to get a mammogram were about half as likely to have screening mammograms within the last 12 months (OR = 0.43) as women who reported no such concern. However, having had a larger number of mammograms (OR = 3.17); having a high frequency of clinical breast examinations (OR = 2.46), and performing frequent breast self-examinations (OR = 1.60) were all strongly and positively predictive of having screening mammograms.

As noted earlier, the main dependent variable in this study is having a screening mammogram within the last 12 month. A secondary outcome variable of interest is never having had a mammogram. Nearly one fifth (18.2%) of the women in our sample reported never having a mammogram *(never-users)* in contrast to 413 (81.8%) women who reported having at least one mammogram *(ever-users).*

Table 4. Demographic Characteristics of the Sample (*n* = 505) Compared to the 1997 Estimates for Residents in the King/Drew Medical Center Service Area

	Study sample		King/Drew service area†	
	#	%	#	%
Race/ethnicity				
◆ African American	182	36.0	499,892	27.8
◆ Asian/Pacific Islander	10	2.0	72,861	4.1
◆ Hispanic	222	44.0	1,059,854	59.1
◆ White	60	11.9	156,212	8.7
◆ Other	31	6.1	6,232	0.3
Total	505	100.0	1,795,051	100.0
Education (Persons > 18 years old)	213	42.3	549,956	44.7
◆ <High school	105	20.8	272,258	22.1
◆ High school grad	119	23.6	287,001	23.4
◆ 1–3 years college	67	13.3	120,239	9.8
◆ ≥College grad	504	100.0	1,229,454	100.0
Median Family Income	$22,500		$26,145	

Source: *Health District Profiles,* County of Los Angeles, Department of Health Services, Division of Health Assessments and Epidemiology, 1999.

Table 5. Self-Report of All Mammography Use by Race/Ethnicity (*n* = 505)

	AA (*n* = 182)		API (*n* = 10)		W (*n* = 60)		Hisp (*n* = 222)		Others (*n* = 31)		Total (*n* = 505)	
	n	%	*n*	%	*n*	%	*N*	%	*n*	%	*n*	%
Ever had a mammogram	136	74.7	8	80.0	52	86.7	189	85.1	28	90.3	413	81.8
Never had a mammogram	46	25.3	2	20.0	8	13.3	33	14.9	3	9.7	92	18.2
Ever had a mammogram												
➢ ≤12 mos	77	42.3	5	55.6	32	53.3	116	52.3	14	45.2	244	48.4
➢ 13–24 mos	35	19.2	—	—	14	23.3	43	19.4	6	19.4	98	19.4
➢ ≥25 mos	21	11.5	2	22.2	4	6.7	30	13.5	7	22.6	64	12.7
➢ Missing										7	1.7	
Reason for the last mammogram												
➢ Screening	114	85.1	8	100	49	96.1	171	91.0	25	89.3	367	89.7
➢ Diagnostic	20	14.9	—	—	2	3.9	17	9.0	3	10.7	42	10.3
➢ Missing											4	1.0

Bivariate analyses reveal that women who have never had a mammogram were younger (p = 0.000), African American (p = 0.008), with less than $20,000 in total annual household income (p = 0.001), and having less education (p = 0.000) than women who have had one or more mammograms. Additionally, women who have never had a mammogram were less likely to have insurance (p = 0.000) and were less likely to be referred by their doctor or other professionals to have a mammogram (p = 0.000).

The cost of a mammogram (p = 0.017), the feeling of embarrassment by the procedure (p = 0.005), being inconvenienced by the time it takes to have a mammogram (p = 0.000), having difficulties in getting to the doctor's office (p = 0.000), and being concerned about exposure to radiation (p = 0.000) were all highly associated with women not having a mammogram. Among attitudinal measures, women who have not had a mammogram were more likely to think that the procedure is *not accurate* in detecting breast cancer (p = 0.002). Similarly, women who have never had a mammogram were less likely to perform breast self-examinations (p = 0.033) or have clinical breast examinations (p = 0.000).

Six variables were found to have predictive value in a logistic regression analysis and are listed in Table 6. These predictive variables include: being younger (OR = 2.50); having no health insurance (OR = 3.06); having no physician referral for a mammogram (OR = 2.94); being concerned about mammograms finding breast cancer (OR = 0.510); being inconvenient to have a mammogram (OR = 2.38); and being fearful of exposure to radiation (OR = 2.46).

DISCUSSION

Research suggests that the early detection of breast cancer before micrometastases occur (nonpalpable tumors ≤ 10mm) is only possible by mammography.[20] Breast cancer mortality could be reduced significantly if the rate of compliance with current screening recommendations by the American Cancer Society were increased.[21] A number of barriers and facilitators have been associated with breast cancer screening compliance. The purpose of this descriptive, theoretically based study was to identify factors related to adherence to routine mammography guidelines in a multiethnic sample of women residing in South Central Los Angeles.

Utilization of screening mammography in our sample was a little lower than in recent general population estimates. The 1997 Behavioral Risk Factor Surveillance System (BRFSS), that is a national survey of women 40 years and older, found that 71.3% had a mammogram within the prior 24

Table 6. Results of Logistic Regression Analyses Predicting Likelihood of "Never" Having a Mammogram (n = 505)

Variable	Bivariate	Logistic regression		
	χ^2	β	OR	95% CI
Age	13.19*	0.92	2.50	1.47–4.25
Insurance	30.52*	1.12	3.06	1.80–5.20
Professional recommendation	29.56*	1.08	2.94	1.77–4.89
Concern about mammogram finding breast cancer	3.04	−0.67	0.51	0.29–0.90
Inconvenient to take time to get mammogram	16.57*	0.87	2.38	1.08–5.23
Concern about exposure to radiation from mammogram	16.26*	0.90	2.46	1.45–4.17

*Statistically significant at $P < 0.05$.

months[2] compared to the 67.8% in our sample. Furthermore, 48.4% of our sample indicated that they had had a mammogram within the last 12 months, and 72.7% reporting that their most recent test was for screening purposes. These findings are similar to those of other researchers who have reported yearly rates ranging from 66.3% to 80.7% among low-income, inner-city women.[22,23] These results suggest that the screening mammography rate in the population of the King/Drew Medical Center service area in South Central Los Angeles is lagging behind national and other estimates.

Although African Americans were less likely to be screened than others in our sample, race/ethnicity (p = 0.122) was not a determining factor in the receipt of screening mammograms in the past 12 months. This could be due in part to the small percentage of Caucasians (11.9) and Asians (2.0) in our sample. Whereas similar results have been reported by some,[11,24] others have reported that ethnicity was significantly related to obtaining screening mammogram in low-income minority women.[3–5,25,26]

Previous research indicates that mammograms are under-utilized, particularly by older women.[9,27,28] In the bivariate analysis, we found that women ages 50 to 64 were significantly more likely than younger women to have mammograms in the past 12 months (p = 0.000), although this significance was not maintained in the multivariate analysis. This suggests that older women in our sample were getting screening mammograms at a rate higher than their younger counterparts. In addition to their older patients, primary care physicians should routinely refer their younger patients (40 to 49 year olds) for screening mammograms.

Inconvenience, cost, and difficulty in getting to a clinic or doctor's office were significant barriers to having a mammogram in the bivariate analysis (see Table 2). However, among these barriers, only inconvenience remained a significant factor in the logistic regression analysis, which is similar to the findings of Maxwell and colleagues.[29]

In our sample, inconvenience in getting to the doctor's office was the only variables of the Health Belief Model (HBM) that was predictive of screening behavior in both the bivariate and multivariate analyses. It may be that additional variables are needed to improve the predictive ability of this theoretical framework on screening behavior among low-income inner city women. Mixed results are reported in the literature suggesting that the contribution of HBM remains unclear.[12,21,29–31]

Strong and independent predictors of having mammograms in our study included the number of mammograms a woman ever had; the frequency of clinical breast examinations; and the frequency of breast self examinations. These results suggest that once a women is motivated to have a breast examination, she is likely to continue this potentially life saving practice. Health care providers should conduct and promote the practice of breast examinations and inform their patients that many health insurance companies will pay for screening mammograms.

In this sample, the profile of women who never had a mammogram (18.2%) differs significantly from that of women who had a mammogram within the past 12 months on five independent predictor variables. These predictor variables include: age, insurance, professional recommendation, concerns about mammogram finding breast cancer, inconvenience, and concerns about exposure to radiation (see Table 6). Our findings suggest that younger women may be under-utilizing screening mammograms because of limited resources, under-estimat-

ing their risk of contracting breast cancer and/or because their health providers fail to refer this population for screening mammograms. Our data also indicate that women who have insurance are three times more likely to get screening mammograms. This seems to suggest that community-based campaigns should be expanded to make screening mammograms affordable to women who lack health insurance.

Research indicates that if health practitioners provide women with sufficient information about the risk of breast cancer and communicate the message of prevention in a sensitive and personal fashion, women will show greater adherence to recommended guidelines.[3,9,10,32,33] Our data fully support this finding. In our sample, women who did not receive recommendations from their providers were nearly three times less likely to have a screening mammogram. This finding suggests that primary care practitioners should have a clear understanding of the current recommended guidelines for screenings and refer and follow-up accordingly with their patients. Our findings also suggest that women who have never had a screening mammogram are more likely to be fearful of breast cancer, concerned about the time it takes to get a mammogram, and concerned about exposure to radiation. This suggests that motivating these women to have a screening mammograms require a nonjudgmental educational approach that includes an analysis of the costs and benefits of action and inaction to help patients overcome these barriers.

CONCLUSIONS

Breast examinations and regular mammograms offer women the best chance of early detection and treatment of cancer to maximize the quality of life and prolong their postdiagnosis survival. The practice of a healthy lifestyle, including the appropriate use of screening mammography, is a personal responsibility. However, physicians also play a key role in promoting good health practices including referring their patients for screening mammograms and following-up on those referrals. Therefore, it is important that women and their health care providers be cognizant of and adhere to current screening recommendations. Additionally, there is a need to improve access to screening mammography in a population of women who have never had mammograms or who are substantially noncompliant with current guidelines. In our sample, this represented almost one third of the participants (92 never users and 54 whose last mammogram was more than 24 months ago; 146/505 = 28.9%).

Limitations and Future Directions

The exclusion of households without telephones, the relatively low response rate, and the accuracy of self-reports about screening behaviors are limitations of this study. The local telephone company, however, estimates that more than 95% of all households in the study area has at least one active telephone line. High response rates to telephone surveys among inner city residents are difficult and very expensive to achieve. The 41% response rate to this survey is an acknowledgment and acceptance of the prohibitively high cost-benefit ratio of increasing the response rate. The validity of self-reports has been reported in the literature and is widely used in evaluating changes in the utilization rate of screening mammography.

The findings of this study are consistent with, and extend the findings of, prior researchers. However, due to the cross-sectional nature of our data, we could not establish causal relationships between predictors and the outcome variables. Longitudinal studies are needed to establish the causal relationships between screening mammography and its predictors. Researchers also need to identify provider-related barriers to screening mammography recommendations and evaluate means of overcoming those barriers

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