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Mammography Screening among Chinese-American Women

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Abstract

BACKGROUND—Breast carcinoma is the most common major malignancy among several Asian-American populations. This study surveyed mammography screening knowledge and practices among Chinese-American women.

METHODS—In 1999, the authors conducted a cross-sectional, community-based survey in Seattle, Washington. Bilingual and bicultural interviewers administered surveys in Mandarin, Cantonese, or English at participants' homes.

RESULTS—The survey cooperation rate (responses among reachable and eligible households) was 72% with 350 eligible women (age ≥ 40 years with no prior history of breast carcinoma or double mastectomy). Seventy-four percent of women reported prior mammography screening, and 61% of women reported screening in the last 2 years. In multivariate analysis, a strong association was found between mammography screening and recommendations by physicians and nurses (prior screening: odds ratio [OR], 16.0; 95% confidence interval [95% CI], 7.8–35.0; recent screening: OR, 7.0; 95% CI, 3.8–13.6). This finding applied to both recent immigrants (< 15 years in the U.S.) and earlier immigrants (≥ 15 years in the U.S.). Thirty-two percent of women reported that the best way to detect breast carcinoma was a modality other than mammogram.

CONCLUSIONS—The authors recommend a multifaceted approach to increase mammography screening by Chinese-American women: recommendations from the provider plus targeted education to address the effectiveness of screening mammography compared with breast self examination and clinical breast examination.

Keywords

mammography; screening; Asian; Chinese

In 2002, it is estimated that 203,500 women will be diagnosed with breast carcinoma in the U.S.[1] Epidemiologic studies have demon-strated an increased risk of breast carcinoma in Asian

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women after migrating to the U.S.[2–8] Among several Asian-American populations, breast carcinoma is the most common major malignancy and the leading cause of cancer mortality,[9,10] yet community surveys consistently have demonstrated low mammography screening rates among specific Asian-American ethnic groups.[11–26] In the *Pathways to Early Cancer Detection Project*, compared with white women (93%), black women (91%), and Hispanic women (80%), significantly lower proportions of Chinese women (73%) and Vietnamese women (46%) reported prior mammography screening.[27]

It is projected that, by the year 2050, Asians and Pacific Islanders will comprise 10% of the U.S. population.[28,29] To assess current screening knowledge and practices, we conducted a community-based survey that addressed the mammography screening behavior of Chinese-American women in Seattle, Washington, in 1999. Given the dearth of information on the perception by Asian-American women of mammography's effectiveness, we also explored two variables guided by the Health Belief Model addressing perceived personal risk and the benefits of various breast cancer screening modalities.

MATERIALS AND METHODS

Study Sample

The study sample was taken from the Cervical Cancer Control in North American Chinese Women's Health Project, the details of which have been published elsewhere.[30] The Human Subjects Review Board of the Fred Hutchinson Cancer Research Center approved this survey.

To recruit a representative sample, two complementary sampling methods were used to identify Chinese households within target zip codes where the majority of Seattle's Chinese population resides.[31] First, we used multiple data sources (e.g., published articles and cancer registry data) to compile a comprehensive list of Chinese surnames. Using this list, we randomly selected 714 Chinese households in our target zip codes from the 1998 Seattle telephone book. Second, we purchased a commercially available listing of Chinese households from the American List Council of New Jersey. Another 1231 households were selected randomly from this marketing company list, yielding our final study sample of 1945 women. The details of these sampling methods have been described previously.[32]

All interviews were conducted in respondents' homes by bilingual and bicultural, Chinese-American female interviewers. Each woman who agreed to participate was given the option of completing the survey in Cantonese, Mandarin, or English and received a small stipend as a token of appreciation for her time. Criteria for eligibility into the study consisted of the following: age $\geq$ 20 years and fluency in either Cantonese, Mandarin, or English. In households with two or more eligible women, the interviewer asked to speak with the oldest woman. When the older woman refused to participate or was not available, the interviewer then asked the next oldest woman to participate in the survey. Our study adopted this method rather than one based on a random selection algorithm, because it has been shown that attempts to enumerate household members reduce response rates in Asian immigrant communities (unpublished results). Interviewers made at least five attempts (including at least one daytime attempt, one evening attempt, and one weekend attempt) to contact each household.

Survey Instrument

The objective of our survey was to examine multiple preventive behaviors (e.g., Papanicolaou testing, mammography, and hepatitis B serologic testing) while minimizing participant burden. Therefore, study households were assigned randomly to one of three versions of our survey instrument that addressed different preventive behaviors. Approximately 67% of the women were asked to complete the version that included questions about mammography screening.

Because current breast cancer screening guidelines of the American Cancer Society and the National Cancer Institute recommend that women age ≥ 40 years should have regular mammograms,[33,34] we restricted the survey items in our mammography screening section to women age ≥ 40 years.

Survey questions were developed in English, translated into Chinese, and back-translated into English to ensure lexical equivalence.[35] A core group of multilingual researchers and staff members reconciled any differences; then, the questions were pretested. Items on mammography screening were taken from the *Pathways to Early Cancer Detection* questionnaire that has been used successfully in several Asian-American populations.[18,27,36] Women age ≥ 40 years were asked whether they had ever had a mammogram and, if so, whether they had been screened within the last 2 years. Other survey questions addressed age, country of birth, religion, marital status, educational level, household income, housing type (owned, rented, or government subsidized), and employment outside the home. We also asked each woman to specify how many years she had lived in North America and which of the following languages she spoke fluently: Cantonese, Mandarin, or English. Additional variables addressed included health care, barriers and facilitators to screening, attitudes and beliefs regarding cancer, perceived breast carcinoma risk, and the benefits of mammogram, clinical breast examination (CBE), and breast self-examination (BSE).

Data Analysis

Outcome variables included whether a woman had ever had a screening mammogram (yes or no) and whether she had received a recent screening mammogram in the previous 2 years (yes or no). Descriptive bivariate analyses compared women who had been screened (ever screened and recently screened were analyzed separately) with women who had not been screened. Chi-square tests were used to assess statistical significance, and, when necessary, Fisher exact tests were performed.

We used unconditional logistic regression models to describe factors that were associated independently with mammography screening. For a model-building strategy, we used a stepwise selection method in which the most significant variables (in terms of the deviance change) were added one at a time; this sequential process included an elimination step after each new addition to remove those variables from the model that failed to meet a 5% level of significance. These steps were continued until no other variable could be added that produced a significant change in deviance.[37]

Our previous study in Cambodian-American women identified significant associations of physician gender and ethnicity with mammography screening.[12] Because language plays an integral role in the patient-physician encounter, we also examined the association of language concordance with screening behavior in the current study.

The three variables that examined language concordance with physician ethnicity and gender included the following: 1) *have a regular doctor* (two categories; yes or no); 2) *language concordance with the regular doctor* (four categories; no regular doctor, concordant in Chinese, concordant in English, or non-concordant); and 3) *gender of the regular doctor* (three categories; no regular doctor, male doctor, female doctor). Because the group of women with no regular physician appeared in all three variables, the standard formulation of interactions by crossing categories of one variable with categories of another variable would create a large number of redundant parameters. After carefully studying the three-way interactions, we selected a grouping that concisely summarized and described the complex effect modifications. This grouping included Chinese with male physicians, Chinese with female physicians, English with physicians, no language concordance with physicians, and no regular physician.

Because factors associated with mammography screening may differ between recent immigrants and earlier immigrants, we assessed the association stratified by years since immigration to the U.S. (< 15 years vs. ≥ 15 years). The logistic regression model, which was constructed from all the women's data, was used as a base model for this stratified regression analysis. Additional significant variables, which were identified using the stepwise variable-selection method described above, were added to the base model. The stratified regression analysis, however, was limited due to small sample sizes: therefore, its goal was to explore differences qualitatively by years since immigration.

Participant Characteristics

Seven hundred ten women participated in the survey. Two hundred forty respondents were identified through the telephone book, and 470 respondents were identified through the marketing company list. The final disposition of the remaining 1235 households in our original study sample was as follows: 163 nonresidential addresses, 598 respondents who were verified as ineligible (including 21 Chinese women who did not speak Mandarin, Cantonese, or English), 196 respondents who could not be contacted, and 278 respondents who refused participation.

The total estimated household response rate was 64%, and the cooperation rate (i.e., responses among reachable households and eligible households) was 72%. Four hundred seventy-three participants completed Version 1, which included the mammography screening items used in this analysis. The mammography section was restricted to women age ≥ 40 years and was completed by 375 women. Twenty-one women who reported that they had a history of breast carcinoma or underwent double mastectomy were excluded. Another four participants were excluded due to a lack of response to the history questions for mammography screening.

Two hundred thirty-seven participants completed a version of the survey that did not include mammography questions (Versions 2 and 3). Of these, 187 women were age ≥ 40 years. We did not observe any significant differences in the following characteristics between women who completed Version 1 and women who completed Versions 2 and 3: age ($P = 0.95$), birthplace ($P = 0.81$), marital status ($P = 0.83$), religion ($P = 0.25$), educational level ($P = 0.19$), household income ($P = 0.16$), type of housing ($P = 0.42$), proportion of life in North America ($P = 0.40$), English fluency ($P = 0.35$), employed ($P = 0.23$), and health insurance ($P = 0.40$).

RESULTS

The mean age ± standard deviation of the women in our sample was 58 years ± 12 years. The majority of women in our sample were older, were married, and were born in Mainland China (Table 1). The mean length of residence in North America was 19 years. A majority reported they had lived in North America for at least 25% of their lives and were not fluent in English. Greater that 50% of women were employed in the previous year, and most women had health insurance. A significant proportion of women did not report household income (42%).

Bivariate Analyses

Ever screened—Seventy-four percent of the women surveyed reported a prior mammogram (Table 2). Our results show that women who were Buddhist, women who were not fluent in English, and women who had lived in the U.S. for < 25% of their lifetime had lower screening rates. Barriers, such as difficulty in finding interpreters and the cost of medical care, also were associated negatively with screening behavior.

Women who reported owning their own home, had health insurance, received prenatal care, or received family planning services were more likely to have been screened. Women who believed that some malignancies are curable if detected early and women who believed that poor *qi* and blood circulation can lead to malignant disease also were more likely to have had prior screening.

Physician characteristics and language concordance with the physician in English were associated significantly with screening. We found no significant association between a woman's risk perception for breast carcinoma and prior screening. Women who reported that mammography was the best way to detect breast carcinoma were more likely ever to have had a mammogram. Recommendations by medical personnel, family members, or friends also were associated significantly with prior screening.

Recently screened—Fewer women (61%) reported that they had a mammogram in the last 2 years (Table 2). There was a statistically significant association between the country of birth and recent mammography screening. Women who were not fluent in English and women who had lived in the U.S. for < 25% of their lives were less likely to have received a mammogram in the previous 2 years. The belief that *qi gong* is important to health was associated negatively with a recent examination. Being employed, owning a home, and having health insurance were associated positively with recent screening. Women who believed that some malignancies are curable if they are detected early and that poor *qi* and blood circulation can lead to malignant disease were more likely to have had a recent screening. The proportion of women with a recent mammogram was greater among those who had a close friend or relative with cancer compared with women without a recent mammogram.

Physician characteristics, prior prenatal care, and family planning services all were associated with the likelihood of having had recent screening. Language concordance with the physician in English also was correlated with recent screening.

There was no association between the perception of risk for breast carcinoma and recent screening. The proportion of women who reported that a mammogram was the best way to detect breast carcinoma was significantly greater for recent screening. Recommendations by medical personnel, family members, or friends also were associated positively with recent screening.

Multiple Regression Analyses

Ever screened—Multiple logistic regression analysis demonstrated that recommendation by a physician or nurse greatly increased the odds of a prior screening compared with no recommendation, as shown in Table 3. Having language concordance with a female Chinese physician was associated strongly with ever having had a mammogram compared with women who had no regular physician. Language concordance in English and no language concordance with the physician were associated modestly with a prior mammogram. The association of having language concordance with a male Chinese physician was modest and was not statistically significant.

Women who believed that BSE, CBE, or other tests were better than mammography for detecting breast carcinoma had lower odds of ever having had a mammogram. Other variables that were associated negatively with a prior mammogram included never being married and concerns about financial costs. Women who believed that malignant disease can be caused from poor *qi* or blood circulation had greater odds of having had a prior mammogram.

Recently screened—Recommendation by a physician or nurse also resulted in higher odds for recent screening. Similarly, the odds of recent screening were significantly higher for

women who lacked language concordance but who had a regular physician. In fact, language concordance in English with a physician and language concordance in Chinese with a female physician both were found to be correlated positively with recent screening. Women who were never married or believed that BSE or CBE were the best ways to detect breast carcinoma were less likely to have had recent mammograms.

We found no statistically significant differences in concern about financial cost or employment during the past year. Women who believed that malignant disease can be caused from poor *qi* or blood circulation had higher odds of recent screening, whereas the association between the belief that malignant disease can be prevented by *qi gong* and recent screening was significantly lower.

Recent Immigrants

Among women who resided in the U.S. for < 15 years, physician recommendation and Chinese language concordance with a female physician were associated positively with prior and recent screening (Table 4). Women who were never married and women who reported prior prenatal care in the U.S. had lower odds of prior and recent mammograms. We found varying results for the *traditional Chinese health belief* variables. Women who believed that malignant disease was caused by imbalances of *yin* and *yang* were less likely to have had screening; whereas women who believed that malignant disease can be caused by poor *qi* and blood circulation had significantly greater odds of screening. Results from the stratified analysis showed that Buddhism and the belief that malignancy can be prevented by doing *qi gong* were associated negatively with recent screening.

Earlier Immigrants

Physician recommendation was the only variable that was associated positively with both prior and recent screening in women who had lived for a longer period in the U.S. (Table 5). Women who believed that malignant disease can be caused by poor *qi* and blood circulation were more likely to have been screened recently. The belief that BSE or CBE were the best modalities to detect breast carcinoma was associated negatively with recent screening.

DISCUSSION

This study identified a strong association between medical providers' recommendations and mammography screening by Chinese-American women. Our bivariate analyses showed significant correlations of mammography screening with acculturation (as measured by English fluency and proportion of life in the U.S.); however, contrary to previous studies, our multivariate analysis did not find that education, income, health insurance, or having a regular physician were major determinants of screening behavior. These results most likely reflect the availability of free breast cancer screening services through Washington State's Breast and Cervical Health Program to low-income women.

Studies have demonstrated that physician recommendation is a strong predictor of mammography screening in the general population.[38–42] Similar to prior surveys of Vietnamese, Filipino, Korean, and Chinese-American women,[17,22,43–45] our results underscore the importance of medical personnel as an avenue to promote mammography screening for Chinese-American women. Although recommendations by family and friends were correlated with screening, only recommendations by medical personnel remained significant in our multivariate analysis. This finding applied to both recent immigrants and earlier immigrants.

A major strength of this study is the examination of language and gender concordance between physicians and Chinese-American women. Language has been documented as a barrier to screening behavior for limited English-speaking patients, and Asian patients reportedly have greater difficulty communicating with their physicians.[22,46] Although other studies have examined language with a focus on interpreter availability, we did not find that this variable was associated with mammography screening after adjusting for other covariates. Instead, in our multivariate analysis, we found a complex association between language and gender concordance with physician and mammography screening.

Compared with women who had no regular physician, women who had a female physician and Chinese language concordance had the greatest likelihood of prior and recent screening. Using the same referent group, language nonconcordance and language concordance in English both resulted with greater odds of mammography screening. Although the point estimate for language and gender concordance with physician is unstable (due to the small sample size), the lower confidence limits were > 1.0. It is interesting to note that language concordance in Chinese with a male physician did not increase screening. When stratified by years in the U.S., as expected, language concordance with a Chinese female physician was associated significantly with screening only for recent immigrants (Table 4).

The current survey did not collect information on physician training. We found only one published study of primary care physicians serving Chinese Americans in San Francisco. In that study, Lee et al. surveyed physicians' attitudes, beliefs, and practices regarding cancer screening guidelines; however, those authors did not examine differences by gender. The physicians were predominantly male (84%), with younger participants performing more screening tests.[47] Given the trends of medical school admissions, we hypothesize that Chinese female physicians are younger, have been trained more recently, and, thus, are more likely to recommend screening.

Another strength of the current study was the use of behavior theory to understand Chinese-American women's screening behavior. Although the Health Belief Model has been applied widely to mammography screening behavior in the general population,[48–53] at the time of this study, we did not find any published data using variables from this model in any Asian-American population. The association between perception of breast carcinoma risk and mammography screening has been established for the general population.[54–57] Although our results did not show similar results for Chinese-American women, this most likely was due to the small sample of women who perceived their breast carcinoma risk as moderate. Therefore, we also examined mammography screening among women who perceived *no risk*, *some risk*, or were *not sure/did not know*. Again, we found no association between perceived risk and prior screening ($P = 0.23$) or recent screening ($P = 0.53$). Women often substantially overestimate their breast cancer risk;[58–60] in contrast, nearly 40% of women in our survey reported that they were not sure or did not know their breast carcinoma risk. We did not find any data on minority women to compare with our findings, although one study of African-American women reported that 41% underestimated their risk.[61] These results indicate the need for additional studies to further understand the relevance of personal breast carcinoma risk for Chinese women and possibly for other Asian-American women. Appropriate strategies for risk education must also be explored.

To our knowledge, this is also the first report of Chinese-American women's perceptions regarding the effectiveness of various breast carcinoma screening modalities. With nearly 33% of the women identifying BSE, CBE, or another modality as the best way to detect breast carcinoma, educational materials for this population should emphasize the benefits of screening mammograms compared with BSE and CBE.

The current results also show that women who have never been married are less likely to have been screened, especially women who have lived in the United States for < 15 years. Furthermore, among recent immigrants, previous exposure to the health-care system in the U.S. through prenatal care was not associated with screening. Culturally appropriate efforts to promote screening in these women are warranted.

With respect to traditional Chinese health beliefs, such as *yin/yang* imbalance, and poor *qi* and blood circulation, our results did not show any consistent correlations with mammography screening (Table 3). These beliefs appear to be more important for recent immigrants; however, the correlation among the variables was high, and, with the small sample size, estimates for these variables are unstable.

Our study must be interpreted with the following considerations. First, we surveyed households from two neighborhoods with a high density of Chinese residents. Compared with the survey by Yu et al., women in the current study were older, had lived longer in the U.S., and were more educated.[22] Our results, therefore, may not be representative of Chinese-American women residing in other geographic areas or neighborhoods with low proportions of Asian Americans. Second, these screening results probably are lower compared with the results in a group of more acculturated women. In the study by Yu et al., women who reported greater fluency in spoken English had higher CBE and mammogram rates.[22] Third, because the current survey was voluntary, our results may be overestimated, because women who have had mammograms may be more likely to complete the survey. Fourth, participants may over-report screening due to acquiescence bias. A recent study in California documented over-reporting of Papanicolaou tests and screening mammograms by Chinese-American women: only 66% and 64% of self reports were valid, respectively.[62] Finally, our assessment of English fluency (yes or no) may have been inadequate in capturing functional language competence.

Despite these potential limitations, our results show that much work remains. Over 25% of the Chinese-American women in our study never had a mammogram, and nearly 40% of women had not had a recent mammogram. Our study demonstrates that, although language concordance with physicians was associated with higher rates of screening, similar to the general population, recommendations by physicians or nurses can increase mammography screening significantly among Chinese-American women. Efforts to effectively promote screening through the provider, regardless of their ethnicity or language concordance, should be explored further.

With nearly 33% of the women reporting BSE, CBE, or another modality as the best way to detect breast carcinoma, our results suggest a lack of understanding regarding the various breast carcinoma screening modalities. Therefore, we recommend a multifaceted approach to increase mammography screening by Chinese-American women: recommendations from the provider plus targeted education to address the effectiveness of screening mammography compared with BSE and CBE.

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TABLE 1

Respondent Characteristics (n = 350 patients)

Characteristic	No. of patients[a]	%
Age (yrs)		
40–49	92	26.3
50–64	146	41.7
≥65	112	32.0
Place of birth		
Mainland China	258	73.7
Southeast Asia (Cambodia, Vietnam)	37	10.6
Hong Kong	28	8.0
North America (Canada, US)	15	4.3
Other	12	3.4
Religion		
Buddhism	105	30.6
Christianity	67	19.5
Other	1	0.3
None	170	49.6
Marital status		
Currently married	274	78.7
Previously married	68	19.5
Never married	6	1.7
Education (yrs)		
<7	136	39.2
7–12	155	44.7
≥13	56	16.1
English fluency		
Yes	37	10.6
No	311	89.4
Employed during last year		
Yes	193	55.6
No	154	44.4
Type of housing		
Subsidized	40	11.6
Rented	25	7.3
Owned	279	81.1
Health insurance		
Yes	319	91.4
No	30	8.6
Proportion of life in North America (%)		
0–24	136	39.1
25–49	138	39.7
50–74	57	16.4
75–100	17	4.9

[a] Sample sizes may not sum to 350 due to missing values.

TABLE 2

Sociodemographic and Other Characteristics of Mammography Screening

	Ever screened (%)		Recent screening (%)	
	Yes	No	Yes	No
Total no. of patients	260	90	213	137
Sociodemographic				
Age (yrs)				
40–49	68.5	31.5	59.8	40.2
50–64	78.8	21.2	64.4	35.6
≥65	73.2	26.8	57.1	42.9
Place of birth				
Mainland China	73.3	26.7	60.1	39.9[b]
Southeast Asia[a]	67.6	32.4	51.4	48.6
Hong Kong	78.6	21.4	64.3	35.7
North America[c]	100.0	0.0	100.0	0.0
Other	75.0	25.0	50.0	50.0
Religion				
Buddhism	66.4	33.6[b]	53.9	46.1
Christianity	80.6	19.4	62.7	37.3
Other	0.0	100.0	0.0	100.0
None	78.2	21.8	65.3	34.7
Marital status				
Currently married	75.6	24.4	62.8	37.2
Previously married	73.5	26.5	57.4	42.6
Never married	33.3	66.7	16.7	83.3
Education (yrs)				
<7	71.3	28.7	54.4	45.6
7–12	76.8	23.2	65.8	34.2
≥13	75.0	25.0	62.5	37.5
English fluency				
Yes	89.2	10.8[d]	83.8	16.2[b]
No	73.0	27.0	58.5	41.5
Employed during last year				
Yes	75.7	24.3	65.8	34.2[d]
No	72.1	27.9	53.9	46.1
Income ($)				
< 10,000	64.0	36.0	47.5	52.5
10,000–19,999	78.1	21.9	59.4	40.6
20,000–29,999	87.5	12.5	77.5	22.5
30,000–39,999	74.2	25.8	58.1	41.9
40,000–49,999	71.4	28.6	61.9	38.1
≥ 50,000	83.3	16.7	77.8	22.2
Unknown	73.5	26.5	60.5	39.5
Type of housing				
Subsidized	55.0	45.0[e]	37.5	62.5[e]
Rented	52.0	48.0	48.0	52.0
Owned	79.9	20.1	66.3	33.7
Health insurance				
Yes	76.5	23.5[b]	62.4	37.6[d]
No	50.0	50.0	43.3	56.7
Proportion of life in North America[b] (%)				
0–24	60.3	39.7[e]	49.3	50.7[e]
25–49	79.7	20.3	64.5	35.5
50–74	89.5	10.5	70.2	29.8
75–100	94.1	5.9	94.1	5.9
Health care				
Physician characteristic				
Chinese male	68.2	31.8[e]	54.6	45.4[e]
Chinese female	96.2	3.8	88.5	11.5
Non-Chinese male	82.9	17.1	65.7	34.3
Non-Chinese female	84.8	15.2	74.7	25.3
No regular physician	58.0	42.0	43.2	56.8
Prenatal care in U.S.	81.1	18.9[d]	70.3	29.7[d]
Family planning in U.S.	85.7	14.3[d]	75.3	24.7[b]
Barriers				
Transportation difficulties	67.7	32.3	58.5	41.5
Problems finding childcare	60.0	40.0	55.0	45.0
Problems finding interpreters	68.4	31.6[d]	54.7	45.3
Problems getting routine appointments	74.3	25.7	60.6	39.4
Concerns about cost of medical care	61.2	38.8[e]	56.5	43.5
Facilitators				
Language concordance with physician				

	Ever screened (%)		Recent screening (%)	
	Yes	No	Yes	No
Communicate in Chinese	73.3	26.7[e]	60.0	40.0[e]
Communicate in English	96.3	3.7	88.9	11.1
Nonconcordant	81.3	18.7	67.2	32.8
No regular physician	58.0	42.0	43.2	56.8
Attitudes/beliefs regarding cancer				
Getting cancer is a matter of fate/karma	75.0	25.0	59.1	40.1
Can be prevented by faith	64.3	35.7	57.1	42.9
Can be prevented by doing *qi gong*	69.3	30.7	50.7	49.3[d]
Can be prevented by taking herbs	74.8	25.2	61.3	38.7
Caused by an imbalance of *yin* and *yang*	68.6	31.4	56.9	43.1
Some cancers are curable if detected early	77.0	23.0[e]	64.1	35.9[e]
Close friend or relative had cancer	80.2	19.8	68.7	31.3[d]
Caused by poor *qi* and blood circulation	83.0	17.0[d]	74.5	25.5[b]
Breast cancer health beliefs				
Perceived personal risk				
None	72.8	27.2	59.2	40.8
Low	79.6	20.4	62.5	37.5
Moderate	88.9	11.1	83.3	16.7
Not sure/do not know	71.4	28.6	59.4	40.6
Best way to detect breast cancer				
Breast self examination	63.0	37.0[b]	43.5	56.5[e]
Clinical breast examination	75.0	25.0	57.1	42.9
Mammogram	84.7	15.3	73.0	27.0
Other	87.5	12.5	87.5	12.5
Mammogram recommendation				
By a physician or nurse	91.2	8.8[e]	76.1	23.9[e]
By a family member	90.2	9.8[e]	77.9	22.1[e]
By a friend	86.8	13.2[b]	73.7	26.3[d]

[a] Cambodia or Vietnam.

[b] $0.001 < P \leq 0.01$.

[c] Canada or the U.S.

[d] $0.01 < P \leq 0.05$.

[e] $P \leq 0.001$.

TABLE 3

Odds Ratios and 95% Confidence Intervals of Mammography Screening as Determined by Logistic Regression

	Ever screened		Recent screening	
Characteristic	**OR**	**95% CI**	**OR**	**95% CI**
Mammogram recommendation by M.D./R.N.				
No	1.0	—	1.0	—
Yes	16.0	7.8–35.0	7.0	3.8–13.6
Language and gender concordance with M.D.				
No regular M.D.	1.0	—	1.0	—
Communicate in Chinese				
Male M.D.	2.0	0.8–4.9	2.0	0.9–4.4
Female M.D.	> 999.0	4.5–∞	23.9	3.3–707.7
Communicate in English				
Male/female M.D	6.4	1.0–126.5	5.6	1.5–27.8
Nonconcordant				
Male/female M.D.	4.1	1.7–10.1	3.6	1.8–7.6
Best way to detect breast cancer				
Mammogram	1.0	—	1.0	—
BSE	0.4	0.2–1.1	0.3	0.1–0.7
CBE	0.4	0.1–0.9	0.3	0.2–0.7
Other	0.4	0.1–0.9	0.5	0.2–1.2
Marital status				
Currently married	1.0	—	1.0	—
Previously married	1.2	0.5–3.0	1.0	0.5–2.1
Never married	< 0.05	0.0–0.2	< 0.05	0.0–0.1
Concerns about cost of medical care				
No	1.0	—	—	—
Yes	0.5	0.2–1.0	—	—
Employed during last year				
No	—	—	1.0	—
Yes	—	—	1.9	1.0–3.5
Cancer can be caused by poor *qi* and blood circulation				
No	1.0	—	1.0	—
Yes	2.5	1.1–5.9	3.7	1.8–8.5
Cancer can be prevented by doing *qi gong*				
No	—	—	—	1.0
Yes	—	—	0.4	0.2–0.8

OR: odds ratio; 95% CI: 95% confidence interval; BSE: breast self-examination; CBE: clinical breast examination.

TABLE 4

Odds Ratios and 95% Confidence Intervals of Mammography Screening among Women Residing in the United States for < 15 Years

Characteristic	Ever screened		Recent screening	
	OR	95% CI	OR	95% CI
Mammogram recommendation by M.D./R.N.				
No	1.0	—	1.0	—
Yes	41.0	9.5–266.4	7.6	2.9–28.5
Language and gender concordance with M.D.				
No regular M.D.	1.0	—	1.0	—
Communicate in Chinese				
Male M.D.	1.6	0.3–8.3	0.0	0.0–0.6
Female M.D.	> 999.9	1.8–∞	> 999.9	14.9–∞
Communicate in English				
Male/female M.D.	0.6	0.0–76.4	0.2	0.0–67.9
Nonconcordant				
Male/female M.D.	6.9	1.2–52.0	0.1	0.0–1.4
Best way to detect breast cancer				
Mammogram	1.0	—	1.0	—
BSE	0.3	0.0–1.6	< 0.05	0.0–1.4
CBE	0.2	0.0–0.8	0.2	0.0–8.9
Other	0.0	0.0–0.3	47.8	0.0–∞
Marital status				
Currently married	1.0	—	1.0	—
Previously married	2.0	0.3–17.5	631.9	5.5–∞
Never married	< 0.05	0.0–< 0.05	< 0.05	0.0–< 0.05
Concerns about cost of medical care				
No	1.0	—	—	—
Yes	0.3	0.1–1.1	—	—
Employed during last year				
No	—	—	1.0	—
Yes	—	—	1.5	0.6–4.0
Cancer can be caused by poor *qi* and blood circulation				
No	1.0	—	1.0	—
Yes	27.7	4.2–305.1	5.1	1.8–19.8
Cancer can be prevented by doing *qi gong*				
No	—	—	1.0	—
Yes	—	—	0.3	0.1–0.9
Cancer caused by imbalance of *yin* and *yang*				
No	1.0	—	1.0	—
Yes	< 0.05	0.0–0.2	0.1	0.0–0.5
Religion				
None	—	—	1.0	—
Buddhism	—	—	0.1	0.0–0.4
Christianity	—	—	10.2	2.0–90.1
Prenatal care in the U.S.				
No	1.0	—	1.0	—
Yes	0.1	0.0–0.5	0.1	0.0–0.4

OR: odds ratio; 95% CI: 95% confidence interval; BSE: breast self-examination; CBE: clinical breast examination.

TABLE 5

Odds Ratios and 95% Confidence Intervals of Mammography Screening among Women Residing in the United States for ≥ 15 Years

Characteristic	Ever screened		Recent screening	
	OR	95% CI	OR	95% CI
Mammogram recommendation by M.D./R.N.				
No	1.0	—	1.0	—
Yes	4.2	2.2–9.0	2.3	1.4–3.7
Language and gender concordance with M.D.				
No regular M.D.	1.0	—	1.0	—
Communicate in Chinese				
Male M.D.	0.0	0.0–1.0	0.6	0.2–1.4
Female M.D.	110.2	0.0–∞	2.5	0.6–27.1
Communicate in English				
Male/female M.D.	390.6	0.0–∞	0.9	0.2–4.6
Nonconcordant				
Male/female M.D.	0.1	0.0–3.5	1.5	0.6–3.5
Best way to detect breast cancer				
Mammogram	1.0	—	1.0	—
BSE	< 0.05	0.0–0.9	< 0.05	0.0–0.9
CBE	0.05	0.0–1.1	< 0.05	0.0–0.6
Other	> 999.9	0.7–∞	> 999.9	1.8–∞
Marital status				
Currently married	1.0	—	1.0	—
Previously married	1.0	0.0–∞	0.05	0.0–5.8
Never married	1.0	0.0–∞	236.9	0.0–∞
Concerns about cost of medical care				
No	1.0	—	—	—
Yes	0.7	0.3–1.5	—	—
Employed during last year				
No	—	—	1.0	—
Yes	—	—	1.5	1.0–2.3
Cancer can be caused by poor *qi* and blood circulation				
No	1.0	—	1.0	—
Yes	0.9	0.4–1.9	1.8	1.1–3.2
Cancer can be prevented by doing *qi gong*				
No	—	—	1.0	—
Yes	—	—	0.7	0.4–1.2

OR: odds ratio; 95% CI: 95% confidence interval; BSE: breast self-examination; CBE: clinical breast examination.