Published in final edited form as:

Health Promot Pract. 2011 November ; 12(6): 887–899. doi:10.1177/1524839909355550.

Pilot test of a peer-led small-group video intervention to promote mammography screening among Chinese American immigrants

Annette E. Maxwell, DrPH¹, Judy H. Wang, PhD², Lucy Young, MA³, Catherine M. Crespi, PhD¹, Ritesh Mistry, PhD¹, Madhuri Sudan¹, and Roshan Bastani, PhD¹

Annette E. Maxwell: amaxwell@ucla.edu; Judy H. Wang: jw235@georgetown.edu; Lucy Young: lucy@cchc.org; Catherine M. Crespi: ccrespi@ucla.edu; Ritesh Mistry: riteshm@ucla.edu; Madhuri Sudan: msudan@ucla.edu; Roshan Bastani: bastani@ucla.edu

¹ School of Public Health and Jonsson Comprehensive Cancer Center, University of California, Los Angeles, 650 Charles Young Drive South, Room A2-125 CHS, Box 956900, Los Angeles, CA 90095-6900, Phone: (310) 794-9282, Fax: (310) 206-3566

² Department of Oncology/Cancer Control Program, Georgetown University, 3300 Whitehaven Street NW., Suite 4100, Washington DC, 20007, Phone: (202) 687-6306, Fax: (202) 687-0305

³ Herald Cancer Association, San Gabriel, California, 715 E. Mission Road, San Gabriel, CA 91776, Phone: (626) 286-2600 ext. 13, Fax: (626) 286-2486

Abstract

This study evaluated the feasibility, acceptability and potential effect of a small-group video intervention led by trained Chinese American lay educators who recruited Chinese American women not up to date on mammography screening. Nine lay educators conducted 14 “breast health tea time workshops” in community settings and private homes that started with watching a culturally tailored video promoting screening followed by a question and answer session and distribution of print materials. Many group attendees did not have health insurance or a regular doctor, had low levels of income and were not proficient in English. Forty-four percent of the attendees reported receipt of a mammogram within 6 months after the small-group session with higher odds of screening among women who had lived in the U.S. less than 10% of their lifetime. Four of the educators were very interested in conducting another group session in the next 6 months.

Keywords

small-group/video intervention; mammography screening; Chinese American women

Introduction

Although breast cancer is the most common cancer among Chinese women in California, only 52% report receiving a mammogram within the past year compared to 62% of Caucasian women (McCracken et al. 2007). Limited English skills, lack of health insurance, lack of a doctor’s recommendation, cultural beliefs, and lack of knowledge are barriers to obtaining breast cancer screening among Chinese American women (Wang et al. 2009, in press)(Yu and Wu 2005; Kagawa-Singer et al. 2007). These reported barriers contribute to substantially lower screening utilization in some segments of the population that are often described as “hard-to-reach” (Lee-Lin et al. 2007; Liang et al. 2008).

There is strong evidence that small media interventions such as videos and print materials are effective in increasing mammography screening in diverse U.S. populations – including African Americans, Whites, and Hispanics – and among women with low socio-economic

status in both rural and urban settings (Baron et al. 2008). Studies on the effectiveness of small media among Chinese Americans are lacking. In addition, some studies suggest that trained community members can be effective in increasing adherence to cancer screening (Han et al. 2008); (Campbell et al. 2004; Mock et al. 2007). According to the Community Guide for Preventive Services (<http://www.thecommunityguide.org>) there is insufficient evidence regarding the effectiveness of lay educators at this time, but studies suggest that they may have a small effect in increasing breast cancer screening (Lewin et al. 2005). Peer-led small-group sessions that promote breast cancer screening via a video, flipchart, and/or brochure have successfully been implemented in the Hmong and Korean communities (Tanasiri et al. 2007; Han et al. 2008). However, the feasibility and utility of videos and lay health educators to promote breast cancer screening in the Chinese community have not been examined.

The purpose of the present pilot study was to evaluate the feasibility of training Chinese American lay educators to recruit and deliver breast health educational sessions that include a small media component for Chinese American women who are not up to date on mammography screening. We also assessed the acceptability of this format and its potential effectiveness in increasing screening among group attendees. We have previously shown that Chinese American women had significantly increased knowledge of breast cancer and intentions to get screened after individually watching a culturally tailored video to promote mammography screening (Wang et al. 2008). This study adds to the research by examining a strategy to show and discuss this video in community settings via small-group sessions conducted by trained lay educators. If successful, similar group sessions could potentially be widely used in the community to promote screening.

Methods

Chinese American lay health educators were trained to conduct small-group sessions consisting of three components: 1) viewing a soap opera style video in Chinese language that encouraged screening; 2) facilitating structured discussion among participants about barriers to screening and strategies to overcome barriers; and 3) disseminating information on local resources and providers for low- or no-cost mammograms. The study protocol and materials were approved by the University of California, Los Angeles Institutional Review Board.

Training of lay health educators

Thirty Chinese American women attended a three-hour training conducted in Chinese language. It included procedures for participant recruitment (through health educators' social networks); eligibility criteria (being Chinese American, over 40 years of age, not having had a mammogram during the past two years, and not having scheduled a mammogram in the next six months); human subject training; basic information on breast cancer among Chinese American women and the importance of regular mammograms; and viewing the video and learning to respond to barriers that may be brought up by group members.

Intervention

"Breast health tea time workshops" were conducted at churches, community-based organizations, and private residences. Each session started with watching an 18-minute cultural video in Mandarin or Cantonese. Lay health educators facilitated a question and answer session and distributed a Chinese pamphlet, "Breast Health – Learn the Facts", and a list of local facilities providing low- or no-cost screening mammograms. They received a \$40 stipend for conducting the group session.

The development of the video was guided by the health belief model, and a previous pilot study had demonstrated its efficacy in changing knowledge, beliefs, and screening intentions after women in our target audience viewed it individually (Wang et al. 2008). We addressed Chinese culturally-based beliefs in the video by 1) using a soap-opera story (i.e. a Chinese breast cancer survivor's 50th birthday) that conveyed authenticity and cancer stigma; 2) providing recommendations from a female Chinese physician viewed as a medical authority figure; 3) directly addressing cultural beliefs about fatalism and cancer, yin-yang balance in the body, attitudes to Western examination, social and family support, and family history in the soap opera; 4) having the physician present statistical data pertinent to Asian women and metaphors to help women understand their risk and why regular mammograms save lives; and 5) addressing ways to overcome language barriers and embarrassment. The storyline is played out by an all-Chinese cast speaking Mandarin and shot in a Chinese family setting. This 18-minute DVD is dubbed with Cantonese voices and has English subtitles.

Evaluation

Women who attended the group session completed a short survey immediately before and after the session and received a \$10 gift certificate as an incentive for participation. The pre-survey assessed demographic information, English fluency, access to care, mammography history, and family history of breast cancer. Pre- and post-surveys assessed: knowledge of breast cancer and screening guidelines, using six items selected from a previous study (Wang et al. 2008); perceived susceptibility; barriers to screening (embarrassed, importance of mammogram if no symptoms, concern about radiation); cultural views of cancer and health care (15 items, described below); and intentions to obtain a mammogram in the next three months. Post-surveys also assessed women's subjective evaluation of the video.

We evaluated the breast cancer knowledge items individually and also calculated a total knowledge score as the number of correct answers to the six items. Five items were presented as true or false statements to which women responded "yes", "no", or "don't know". Incorrect responses and responses of "don't know" were scored as 0. Correct responses were scored as 1. The sixth item asked the respondent how often she thought a woman her age should get a routine screening mammogram if she does not have any breast problems. Women 40 to 49 years of age were scored as correct if they responded "every year" or "every one to two years", and women 50 years or older were scored as correct if they responded "every year". Total knowledge scores ranged from 0 to 6 points.

Women's health-related cultural beliefs were assessed by a scale with 15 items (see Table 2) adapted from Wang and colleagues (Liang et al. 2008; Wang et al. 2008). Responses to each item were assessed on a 5-point Likert scale ranging from 1 to 5 as strongly agree, agree, neutral, disagree, to strongly disagree. Lower scores correspond to traditional Chinese beliefs, while higher scores correspond to more "Western" beliefs. Cronbach's alpha values for the pre- and post-survey scale scores were .84 and .89, respectively.

Receipt of mammography (self-report) was assessed in a short phone call six months after the group session. The lay health educators completed a short debriefing via telephone after completion of the session to obtain information on how hard it was to recruit women and to conduct the session (both assessed on a 5-point scale: not hard at all to very hard), how comfortable they felt doing these activities (5-point scale: very comfortable to not at all comfortable), and their interest in conducting more group sessions in the future (very interested/so-so/not interested).

Statistical analysis

We tested for changes in knowledge and attitudes from pre- to post-survey using McNemar's test for binary measures, paired t-tests for continuous measures, and Bowker's test for ordinal categorical data.

Using logistic regression, we assessed bivariate associations between demographic, health care, and other variables and mammography utilization. While receipt of mammogram during the 6-month follow-up interval was the main outcome of interest, we also examined correlates of "ever had a mammogram at baseline" because we wanted to compare correlates of screening at both time points. For each of these outcome variables, we fit a multivariate logistic regression model including all variables that were bivariately associated with the mammogram receipt at $p < .25$ (Hosmer and Lemeshow 2000). Since the number of variables in both models was large relative to the sample size, we also conducted best subsets selection of covariates in order to identify a smaller set of covariates with similar predictive value. We used model fit statistics including max-rescaled R^2 , the c concordance index (area under the ROC curve), and approximate Mallows' C_p (Hosmer and Lemeshow 2000) as model selection criteria to identify models with smaller numbers of covariates that had predictive performance similar to the large multivariate model including all predictors with $p < .25$. Analyses were conducted using SPSS Version 16.0 (Copyright (c) SPSS Inc. 1989–2007 by SPSS Inc., Chicago, IL, USA) and SAS Version 9.1 for Windows (Copyright (c) 2002–2003 by SAS Institute Inc., Cary, NC, USA).

Results

Of the 30 trained lay health educators, nine conducted at least one educational session in Los Angeles County for a total of 14 sessions between March and June 2008 (four in churches, five in community-based organizations, and five in private residences). Through phone calls and face-to-face invitations they recruited 103 Chinese American women who attended a session and completed pre- and post-surveys. Two women were ineligible due to having had their last mammogram within 12 months prior to the educational group session and were excluded from the analyses.

Sample Characteristics

As shown in Table 1, all group attendees were foreign-born. Less than half had some college or higher level of education, 63% reported speaking English poorly or not at all, and only 58% had health insurance. Forty-three percent of the women had never had a mammogram.

Knowledge and attitudes regarding mammography screening

From pre- to post-intervention, there was a significant decrease in the number of women who were concerned about radiation, and a significant increase in the number of women who stated that it was very important to have a mammogram in the absence of symptoms and who planned to get screened in the next three months (see Table 2). Other attitudes did not change significantly, including belief in the efficacy of mammography, perceived likelihood of getting breast cancer, and being embarrassed when getting a mammogram. It should be noted that only about 25% of women were very or somewhat embarrassed when getting a mammogram at pre-intervention. While only 21% of women knew that age is a risk factor for getting breast cancer, more than 70% knew that early stage breast cancer shows no symptoms. About half of the women knew the screening guidelines for a woman their age. Total breast cancer knowledge scores increased significantly from pre- to post-intervention (mean score 2.9 at pre, 4.4 at post, $p < .001$).

There was a significant change in the health-related cultural belief scale score from the pre- to post-intervention surveys (mean score 3.4 at pre, 3.7 at post, $p < .001$). After the intervention, women reported less agreement with statements such as knowing their bodies better than medical doctors, not needing to see a doctor if they took care of themselves and stayed healthy or did not feel sick, medical doctors usually doing unnecessary tests, and medical tests being too intrusive/uncomfortable. Women also reported less agreement with the belief that herbs are a better choice for preventing illness than Western medicine, that having breast cancer is a matter of personal luck, getting breast cancer is like being sentenced to death, and the best way to deal with breast cancer is to accept it.

Mammography utilization at baseline

At baseline, 57% of the women ever had a mammogram. Based on bivariate logistic regression analyses, women who ever had a mammogram were significantly more likely to speak English fluently, well, or so-so (as compared to speaking English poorly or not at all), were more likely to have health insurance, a regular doctor, and a doctor's recommendation to get screened, and had higher knowledge scores at pre-intervention (see Table 3). They tended to have lived in the U.S. more than 10% of their lifetime and tended to answer in the baseline survey that getting a mammogram in the absence of symptoms was very important. Income, age, education, family history of breast cancer, barriers and cultural beliefs were not associated with mammography use at baseline. In multivariate analyses in which all variables with $p < .25$ were entered, having received a doctor's recommendation to get screened emerged as the only significant predictor. Best subsets covariate selection identified three smaller models in which having health insurance and having received a doctor's recommendation to get screened consistently emerged as correlates of ever having had a mammogram. Pre-intervention knowledge score and the belief that getting a mammogram in the absence of symptoms is very important also emerged as predictors in some models.

Receipt of mammogram within six months after the group session

At six-month follow-up, 44 women (44%) reported that they had obtained a mammogram after attending the group session, including 16 women who never had a mammogram before. Based on bivariate logistic regression analyses (see Table 4), reports of mammogram receipt during the follow-up period were significantly higher among women younger than 70 years of age, women who had lived in the United States less than 10% of their lifetime, women who had a mammogram one to two years ago (versus those who had a mammogram less recently or never), and women who did not have health insurance (all $p < .05$). Women who reported receipt of a mammogram tended to be less likely to have a regular doctor and more likely to have a family history of breast cancer as compared to women who did not obtain a mammogram during follow-up (both $p = .054$). Breast cancer knowledge, cultural beliefs, and concerns about being embarrassed and radiation were not associated with receipt of mammogram at six-month follow-up. However, women who endorsed at post-test that it was very important to get a mammogram in the absence of problems were more likely to report receipt of a mammogram during follow-up than those who felt that it was somewhat or not important (52% versus 31%, $p < .009$).

In a multivariate logistic regression model including all variables significant at $p < .25$ in bivariate analyses, perceived importance of getting a mammogram in the absence of symptoms emerged as the only statistically significant predictor of receipt of mammogram during the follow-up period (odds ratio 7.3, $p < .007$). Three smaller models obtained from best subsets covariate selection identified perceived importance of getting a mammogram in the absence of symptoms and having been in the United States less than 10% of the lifetime

as important predictors of screening. Demographic characteristics other than percent of lifetime in the U.S. did not emerge as predictors of screening in the multivariate analysis.

For both sets of subset analyses in Tables 3 and 4, model fit statistics (*c* concordance index and max-rescaled R^2) indicated that the smaller multivariate models had predictive ability comparable to that of the larger multivariate models. The *c* concordance indices, ranging from .74 to .81, indicated very good ability of the models to discriminate between women with and without mammograms at baseline and at follow-up.

Subjective evaluation of the group session by participants

All of the women either strongly agreed or agreed that they enjoyed the video, were glad that they had spent the time to watch it, could relate to some of the characters in the play, were touched by the story, and learned something new from the video.

Debriefing of lay health educators

Eight lay health educators reported that they invited between 15 and 20 women to a group session and one educator who conducted four sessions invited about 70 women. Between 35% and 70% of the invited women attended the sessions, for an average attendance of 49%. There was a range of responses describing how hard it was to recruit (three responded “not hard at all”, four “a little/somewhat hard”, and two “quite hard”), but most were very comfortable (*n*=5) or somewhat comfortable (*n*=4) recruiting women to the session. Most educators stated that it was not hard at all (*n*=6) or a little hard (*n*=3) to conduct the educational group session, and most felt very comfortable conducting the session (*n*=6). About half of the educators were interested in conducting another session in the next six months (four very interested and one so-so), while four were not interested. Those who were not interested thought it was too time consuming to recruit women and to do the group session and found it hard to recruit eligible women.

Discussion

Feasibility of Implementation

This pilot study examined an innovative strategy, small-group educational video interventions conducted by trained lay educators, to promote mammography screening in the Chinese American community. Results suggest that Chinese American volunteers are willing to attend training, to recruit women and to conduct small-group sessions, although only nine out of a total of 30 trained community volunteers actually conducted a session due to the short study duration. A debriefing of these nine volunteers showed that about half of them were interested in conducting a similar session in the next six months. Future studies should explore how to motivate lay educators to continue their volunteer work, maybe by organizing meetings with other volunteers who provide similar services, by acknowledging their important contributions at community events, or simply by allowing more time to schedule and conduct small-group sessions.

Reaching underserved women

Lay educators were quite successful in recruiting women who were truly underserved. Many of the women who attended a small-group session did not have health insurance and a regular doctor, and many had low levels of income and were not proficient in English. All of these factors have been shown to be risk factors for lack of cancer screening (Wu et al. 2005; Yu and Wu 2005; Schueler et al. 2008). Many of these women cannot be reached through the health care system because they only seek health care sporadically, and many do not seek preventive health care (Boult and Boult 1995).

Effects of the small-group video intervention

Our data suggest that the small-group video intervention increased knowledge and positively influenced several attitudes and cultural beliefs regarding mammography screening, as well as mammography utilization. Most influential with regards to mammography screening during the follow-up period was the belief that mammograms are needed in the absence of symptoms. Other studies also suggest that many Asian American women do not value or are not familiar with the concept of preventive health care (Jo et al. 2008) and that many women do not perceive the need to obtain a mammogram (Tang et al. 2000). The video that was shown in the small-group session stresses the importance of getting mammograms regularly even if a woman feels healthy, and it appears that this message was successfully conveyed to women. The other factor that consistently emerged as a predictor of screening during the follow-up period in our sample was a smaller percentage of lifetime in the U.S. (less than 10% of lifetime in the U.S.). Most studies show that Asian immigrants who have lived in the U.S. longer are more likely to receive cancer screening (Maxwell et al. 2000; Kagawa-Singer et al. 2007; Schueler et al. 2008), maybe because women have had more opportunities to get screened, they learn how to navigate the health care system, and they have fewer language and cultural barriers. This was also true in our sample in which better access to health care, having a doctor's recommendation to get screened, and better English fluency were related to ever having had a mammogram at baseline. However, predictors of receipt of a mammogram during the follow-up period were quite different. Our intervention was especially successful in encouraging more recent immigrants to get screened.

As in prior research among Chinese American women (Yu and Wu 2005; Lee-Lin et al. 2007), knowledge about breast cancer and screening did not affect subsequent screening behavior in our sample. Some studies suggest that cultural beliefs are important predictors of screening (Wang et al. 2006; Wang et al. 2008), while others do not (Tang et al. 2000). Recent research among Chinese American women (Wang et al. 2009, in-press) found that cultural beliefs were related to past mammography screening. Cultural and attitudinal factors were also significantly and independently predictive of women's future intentions to obtain a mammogram. Our findings do not support this notion. These inconsistent findings may be due to the fact that these studies assessed a number of different constructs that are labeled cultural beliefs, making comparisons between studies difficult. Larger studies should further investigate whether these variables mediate behavioral change.

The proportion of women who reported an intention to obtain a mammogram almost doubled in our study, similar to results after individual viewing of the same video in another sample (Wang et al. 2008). The proportion of women who reported receipt of a mammogram within six months after the small-group video intervention (44%) was a considerable increase from baseline, when only 12% of women reported having had a mammogram within the past one to two years. The intervention may have served as a reminder to get screened for women who had a recent mammogram, but it also motivated screening among some women who had a mammogram less recently or never had a mammogram at baseline. However, when interpreting this outcome, the following study limitations should be considered: Women may have over-reported receipt of mammography screening due to social desirability bias (McPhee et al. 2002; Burgess et al. 2009). In addition, our study did not include a control or comparison. Thus, we cannot exclude the possibility that the increase in screening observed may be due to a secular trend, participation in the baseline survey, or events other than our intervention. In addition, work shop attendees were a selected sample of volunteers. Based on estimates from the lay health educators, only half of the women who were invited attended a small-group session, and lay health educators may have approached women who in their view were most likely to attend.

Conclusions

This pilot study demonstrates the feasibility of recruiting and training Chinese American lay educators to conduct small-group sessions promoting mammography screening by showing and discussing a culturally tailored video in community settings. This intervention strategy was well accepted and reached underserved Chinese American women, including the uninsured and those with language barriers. Given that this pilot study did not include a comparison group, future studies should more rigorously test the impact of this promising strategy.

References

- Baron RC, Rimer BK, Breslow RA, Coates RJ, Kerner J, Melillo S, et al. Client-directed interventions to increase community demand for breast, cervical, and colorectal cancer screening: a systematic review. *Am J Prev Med.* 2008; 35(1 Suppl):S34–55. [PubMed: 18541187]
- Boult L, Boult C. Underuse of physician services by older Asian-Americans. *J Am Geriatr Soc.* 1995; 43(4):408–411. [PubMed: 7706632]
- Burgess DJ, Powell AA, Griffin JM, Partin MR. Race and the validity of self-reported cancer screening behaviors: Development of a conceptual model. *Prev Med.* 2009; 48(2):99–107. [PubMed: 19118570]
- Campbell MK, James A, Hudson MA, Carr C, Jackson E, Oakes V, et al. Improving multiple behaviors for colorectal cancer prevention among african american church members. *Health Psychol.* 2004; 23(5):492–502. [PubMed: 15367069]
- Han HR, Lee H, Kim MT, Kim KB. Tailored lay health worker intervention improves breast cancer screening outcomes in non-adherent Korean-American women. *Health Educ Res.* 2008
- Hosmer, DW.; Lemeshow, S. *Applied Logistic Regression.* John Wiley & Sons, Inc; 2000.
- Jo AM, Maxwell AE, Rick AJ, Cha J, Bastani R. Why are Korean American Physicians Reluctant to Recommend Colorectal Cancer Screening to Korean American Patients? Exploratory Interview Findings. *J Immigr Minor Health.* 2008
- Kagawa-Singer M, Pourat N, Breen N, Coughlin S, Abend McLean T, McNeel TS, et al. Breast and cervical cancer screening rates of subgroups of Asian American women in California. *Med Care Res Rev.* 2007; 64(6):706–730. [PubMed: 17804823]
- Lee-Lin F, Menon U, Pett M, Nail L, Lee S, Mooney K. Breast cancer beliefs and mammography screening practices among Chinese American immigrants. *J Obstet Gynecol Neonatal Nurs.* 2007; 36(3):212–221.
- Lewin SA, Dick J, Pond P, Zwarenstein M, Aja G, van Wyk B, et al. Lay health workers in primary and community health care. *Cochrane Database Syst Rev.* 2005; (1):CD004015. [PubMed: 15674924]
- Liang W, Wang JH, Chen MY, Shibao F, Lee M, Schwartz MD, et al. Developing and validating a measure of Chinese cultural views of health and cancer. *Health Educ Behav.* 2008; 35(3):361–375. [PubMed: 17602102]
- Maxwell AE, Bastani R, Warda US. Demographic predictors of cancer screening among Filipino and Korean immigrants in the United States. *Am J Prev Med.* 2000; 18(1):62–68. [PubMed: 10808984]
- McCracken M, Olsen M, Chen MS Jr, Jemal A, Thun M, Cokkinides V, et al. Cancer incidence, mortality, and associated risk factors among Asian Americans of Chinese, Filipino, Vietnamese, Korean, and Japanese ethnicities. *CA Cancer J Clin.* 2007; 57 (4):190–205. [PubMed: 17626117]
- McPhee SJ, Nguyen TT, Shema SJ, Nguyen B, Somkin C, Vo P, et al. Validation of recall of breast and cervical cancer screening by women in an ethnically diverse population. *Prev Med.* 2002; 35(5):463–473. [PubMed: 12431895]
- Mock J, McPhee SJ, Nguyen T, Wong C, Doan H, Lai KQ, et al. Effective lay health worker outreach and media-based education for promoting cervical cancer screening among Vietnamese American women. *Am J Public Health.* 2007; 97(9):1693–1700. [PubMed: 17329652]

- Schueler KM, Chu PW, Smith-Bindman R. Factors associated with mammography utilization: a systematic quantitative review of the literature. *J Womens Health (Larchmt)*. 2008; 17(9):1477–1498. [PubMed: 18954237]
- Tang TS, Solomon LJ, McCracken LM. Cultural barriers to mammography, clinical breast exam, and breast self-exam among Chinese-American women 60 and older. *Prev Med*. 2000; 31(5):575–583. [PubMed: 11071839]
- Tanasiri SP, Kagawa-Singer M, Foo MA, Chao M, Linayao-Putman I, Nguyen J, et al. Designing culturally and linguistically appropriate health interventions: the “Life Is Precious” Hmong breast cancer study. *Health Educ Behav*. 2007; 34(1):140–153. [PubMed: 16740519]
- Wang JH, Liang W, Chen MY, Cullen J, Feng S, Yi B, et al. The influence of culture and cancer worry on colon cancer screening among older Chinese-American women. *Ethn Dis*. 2006; 16(2):404–411. [PubMed: 17682242]
- Wang JH, Liang W, Schwartz MD, Lee MM, Kreling B, Mandelblatt JS. Development and evaluation of a culturally tailored educational video: changing breast cancer-related behaviors in Chinese women. *Health Educ Behav*. 2008; 35(6):806–820. [PubMed: 17602099]
- Wang JH, Mandelblatt JS, Liang W, Yi B, Ma JJ, Schwartz MD. Knowledge, Cultural, and Attitudinal Barriers to Mammography Screening among Non-Adherent Immigrant Chinese Women: Ever versus Never Screened Status. *Cancer*. 2009 in-press.
- Wu TY, Guthrie BJ, Bancroft JM. An integrative review on breast cancer screening practice and correlates among Chinese, Korean, Filipino, and Asian Indian American women. *Health Care Women Int*. 2005; 26(3):225–246. [PubMed: 15804695]
- Yu MY, Wu TY. Factors influencing mammography screening of Chinese American women. *J Obstet Gynecol Neonatal Nurs*. 2005; 34(3):386–394.

Table 1**Demographic Characteristics (n=101)**

	<u>n</u>	<u>%</u>
<i>Monthly income (n=74)</i>		
\$1,700 or less	36	49
\$1,701 to \$2,800	20	27
More than \$2,800	18	24
<i>Age in years (57 ±10.3)*</i>		
40 to 49	30	30
50 to 59	34	34
60 or older	36	36
<i>Place of birth</i>		
Taiwan	52	53
China	37	38
Other	9	9
<i>Education</i>		
High school graduate or less	51	53
Some college or more	46	47
<i>Fluency in speaking English</i>		
Poorly or Not at all	61	63
Fluently, Well or So-so	36	37
<i>Language in which read newspapers/magazines</i>		
Mostly or Only Chinese	77	80
Only, Mostly or Half English	19	20
<i>Percent of lifetime in U.S. (28% ±18.5)*</i>		
Less than 10%	22	22
10 to less than 25%	21	21
25 to less than 50%	42	43
50% or more	13	13
<i>Ever had a mammogram</i>	57	57
<i>Time of last mammogram (n=50)</i>		
1 to 2 years ago	12	24
More than 2 years ago	38	76
<i>Family history of breast cancer</i>	7	8
<i>Ever received mammogram recommendation from doctor</i>	48	50
<i>Have health insurance</i>	55	58
<i>Have a regular doctor</i>	45	46

*
mean ± standard deviation

Table 2

Pre- and Post-intervention Attitudes and Knowledge (n=101)

	Pre-Intervention		Post-Intervention		Change (95% CI)	P-value
	n	%	n	%		
<i>Efficacy of Mammography</i>						
Mammogram can detect breast cancer in its early stages (yes)	91	90	93	92		<i>a</i> _{0,791}
<i>Perceived Susceptibility</i>						
Likelihood of getting breast cancer compared to others						
Much more likely	4	4	9	9		<i>a</i> _{0,083}
No difference	22	22	36	36		
Much less likely	17	17	9	9		
Don't know ^b	58	57	47	47		
<i>Embarrassed when get mammogram</i>						
Very or somewhat embarrassed	26	26	19	19		<i>a</i> _{0,118}
Other	75	74	82	81		
<i>Importance of mammogram if no symptoms (n=101)</i>						
Very important	53	52	62	61		<i>a</i> _{0,032}
Somewhat important	26	26	28	28		
Not important	9	9	3	3		
Don't know ^b	13	13	8	8		
<i>Concern about radiation from mammogram</i>						
Very concerned	7	7	0	0		<i>a</i> _{0,001}
Somewhat concerned	39	39	23	23		
Not concerned	41	41	62	61		
Don't know ^b	14	14	16	16		
<i>Plan to have mammogram in next three months</i>						
Yes	38	38	73	72		<i>a</i> _{0,001}
<i>Breast Cancer Knowledge (Correct Responses)</i>						
Early stage breast cancer shows no symptoms	72	71	85	84		
Women without family history cannot get breast cancer	66	65	87	86		
Women can detect all lumps from self-exam	59	58	81	80		

	Pre-Intervention		Post-Intervention		Change (95% CI)	P-value
	n	%	n	%		
The only treatment for breast cancer is mastectomy	27	27	50	50		
Chances of getting breast cancer increase with age	21	21	70	69		
Screening guidelines ^d	50	50	71	70		
	mean $\pm$ s.d.		mean $\pm$ s.d.			
Mean Breast Cancer Knowledge Score	2.9 $\pm$ 1.5		4.4 $\pm$ 1.5		1.5 $\pm$ 1.6 (1.2–1.8)	0.001
<i>Mean Cultural Belief Scores^e</i>						
I know my body better than medical doctors	3.3 $\pm$ 1.2		3.6 $\pm$ 1.0		0.3 $\pm$ 1.2 (0.1–0.5)	0.016
As long as I take good care of myself/keep healthy	3.6 $\pm$ 1.1		3.9 $\pm$ 0.8		0.3 $\pm$ 1.0 (0.1–0.5)	0.001
I don't visit doctors if I'm not feeling sick	3.1 $\pm$ 1.2		3.6 $\pm$ 1.0		0.5 $\pm$ 1.1 (0.3–0.7)	0.001
Medical doctors usually do unnecessary tests	3.2 $\pm$ 1.1		3.5 $\pm$ 1.0		0.3 $\pm$ 1.1 (0.1–0.5)	0.013
A lot of medical tests are too intrusive and make me uncomfortable	2.8 $\pm$ 1.0		3.0 $\pm$ 1.0		0.2 $\pm$ 1.1 (0.0–0.4)	0.082
If healthy, I do not have to visit doctor	3.2 $\pm$ 1.2		3.8 $\pm$ 0.9		0.6 $\pm$ 1.1 (0.4–0.8)	0.001
Chinese medicine can nourish energy	2.9 $\pm$ 1.0		3.1 $\pm$ 1.0		0.1 $\pm$ 0.9 (0.1–0.3)	0.235
Herbs are better for preventing disease than western medicine	3.2 $\pm$ 0.9		3.5 $\pm$ 0.9		0.3 $\pm$ 0.9 (0.1–0.5)	0.002
Herbs are more effective than western medicine	2.9 $\pm$ 0.9		3.1 $\pm$ 0.9		0.1 $\pm$ 0.9 (0.0–0.3)	0.104
Herbs are better remedy for illness than western medicine	3.6 $\pm$ 0.8		3.7 $\pm$ 0.8		0.1 $\pm$ 0.9 (0.0–0.3)	0.144
Having breast cancer or not is a matter of personal luck	3.4 $\pm$ 1.1		3.7 $\pm$ 1.0		0.3 $\pm$ 1.2 (0.0–0.5)	0.040
Getting breast cancer is like being sentenced to death	3.7 $\pm$ 1.0		4.1 $\pm$ 0.7		0.4 $\pm$ 0.9 (0.2–0.6)	0.000
If I am meant to get breast cancer, I will get it	3.8 $\pm$ 0.9		4.0 $\pm$ 0.8		0.2 $\pm$ 0.8 (0.0–0.3)	0.054
If get breast cancer, best way to deal with it is to accept it	4.0 $\pm$ 1.1		4.2 $\pm$ 0.7		0.2 $\pm$ 0.9 (0.0–0.4)	0.026
Health/illness is a matter of fate	4.0 $\pm$ 0.9		4.1 $\pm$ 0.7		0.1 $\pm$ 0.8 (0.0–0.3)	0.128
Scale Mean	3.4 $\pm$ 0.6		3.7 $\pm$ 0.5		0.3 $\pm$ 0.4 (0.2–0.4)	0.001

^aP-value from McNemar Test if 2 categories and Bowker's Test if >2 categories; other p-values from paired samples t-test.

^bDon't Know includes missing and "don't know" responses. These were not included in statistical analysis.

^cResponses of "very concerned" and "somewhat concerned" were combined in statistical analysis.

^dResponses to, "If a woman your age does not have any breast problems, how often do you think she should get a routine screening mammogram?" If age 40–49, correct answers were "every year" or "every 1–2 years". If age 50+, correct answer was "every year"

^eResponses given on a 5-point Likert scale (1=Strongly Agree, 2=Agree, 3=Neutral, 4=Disagree, 5=Strongly Disagree). Higher values indicate a more "Western" attitude. Individual statements have been abbreviated. Missing values were excluded from analysis

Table 3

Logistic regression results for ever had mammogram at baseline; bivariate and multivariate results, including best subsets models

Predictor		Ever Had Mammogram at Baseline		Bivariate OR (95% CI) p-value	Multivar, All Vars with p<0.25 n=76 OR (95% CI) p-value	Multivar, Best Subsets 1 n=80 OR (95% CI) p-value	Multivar, Best Subsets 2 n=91 OR (95% CI) p-value	Multivar, Best Subsets 3 n=80 OR (95% CI) p-value
Monthly income	\$1,700 or less (n=36)	53	47	0.9 (0.4, 2.2)				
	More than \$1,700 (n=38)	56	44	0.801				
Age	70 years or older (n=15)	67	33	1.7 (0.5, 5.4)				
	Younger than 70 years (n=85)	54	46	0.370				
Education	Some college or more (n=46)	59	41	1.2 (0.5, 2.6)				
	High school graduate or less (n=51)	55	45	0.707				
Fluency in speaking English	Fluently, well or so-so (n=36)	69	31	2.7 (1.1, 6.4)	1.1 (0.3, 4.1)			
	Poorly or not at all (n=61)	46	54	0.026	0.927			
Percent of lifetime in U.S.	Less than 10% (n=22)	41	59	0.4 (0.2, 1.1)	0.8 (0.2, 4.1)			
	10% or more (n=76)	62	38	0.085	0.837			
Family history of breast cancer	Yes (n=7)	43	57	0.7 (0.1, 3.1)				
	No (n=84)	54	46	0.588				
Doctor recommended mammogram	Yes (n=48)	71	29	3.7 (1.6, 8.7)	3.7 (1.2, 11)	3.9 (1.4, 11)	3.0 (1.2, 7.8)	3.3 (1.2, 9.2)
	No (n=48)	40	60	0.003	0.025	0.008	0.021	0.024
Have health insurance	Yes (n=55)	69	31	3.4 (1.4, 7.9)	2.2 (0.4, 11)	3.4 (1.2, 9.6)	2.7 (1.1, 6.9)	3.1 (1.1, 8.9)
	No (n=40)	40	60	0.005	0.343	0.021	0.037	0.038
Have a regular doctor	Yes (n=45)	71	29	3.0 (1.3, 6.9)	1.7 (0.4, 7.0)			
	No (n=53)	45	55	0.011	0.463			
Embarrassed when get mammogram (pre-test)	Very or somewhat embarrassed (n=26)	50	50	0.7 (0.3, 1.7)				
	Other (n=75)	59	41	0.443				
Importance of mammogram if no symptoms (pre-test)	Very important (n=53)	62	38	2.2 (0.9, 5.3)	2.7 (0.8, 9.0)	2.8 (1.0, 8.0)		2.1 (0.7, 6.5)
	Somewhat or not important (n=35)	43	57	0.076	0.104	0.061		
Concern about radiation from mammogram (pre-test)	Very/Somewhat concerned (n=46)	52	48	0.6 (0.3, 1.5)				0.188
	Not concerned (n=41)	63	37	0.291				

Predictor	Ever Had Mammogram at Baseline		Bivariate OR (95% CI) p-value	Multivar, All Vars with p<0.25 n=76 OR (95% CI) p-value	Multivar, Best Subsets 1 n=80 OR (95% CI) p-value	Multivar, Best Subsets 2 n=91 OR (95% CI) p-value	Multivar, Best Subsets 3 n=80 OR (95% CI) p-value
	Yes%	No%					
Breast cancer knowledge (one-point increase)	mean $\pm$ s.d. 3.3 $\pm$ 1.4	mean $\pm$ s.d. 2.5 $\pm$ 1.4	1.5 (1.1, 2.0) 0.006	1.4 (0.9, 2.1) 0.149		1.5 (1.0, 2.0) 0.030	1.4 (1.0, 2.1) 0.064
Cultural scale (one-point increase towards more Western views)	3.5 $\pm$ 0.4	3.3 $\pm$ 0.7	1.8 (0.9, 3.8) 0.117	1.0 (0.4, 3.0) 0.938			
c concordance index R ² /max-rescaled R ² Mallow's Cp				0.80 .27/.36 9.0	0.78 .24/.32 1.6	0.79 .24/.32 1.9	0.81 .27/.36 1.5

Table 4

Logistic regression results for receipt of mammogram at 6-month follow-up; bivariate and multivariate results, including best subsets models

Predictor		Completed Mammogram		Bivariate OR (95% CI) p- value	Multivar, All Vars with (n=73) p<0.25 OR (95% CI) p- value	Multivar, Best Subsets 1 (n=81) OR (95% CI) p- value	Multivar, Best Subsets 2 (n=90) OR (95% CI) p- value	Multivar, Best Subsets 3 (n=81) OR (95% CI) p- value
		Yes %	No %					
<i>Monthly income</i>	\$1,700 or less (n=36)	47	53	1.2 (0.5, 3.1)				
	More than \$1,700 (n=38)	42	58	0.658	0.4 (0.05, 3.5)		0.2 (0.04, 1.0)	0.3 (0.04, 1.6)
<i>Age</i>	70 years or older (n=15)	13	87	0.2 (0.03, 0.7)				
	Younger than 70 years (n=85)	49	51	0.019	0.414		0.057	0.138
<i>Education</i>	Some college or more (n=46)	39	61	0.7 (0.3, 1.6)				
	High school graduate or less (n=51)	47	53	0.432				
<i>Fluency in speaking English</i>	Fluently, well or so-so (n=36)	42	58	0.8 (0.3, 1.8)				
	Poorly or not at all (n=61)	48	53	0.575				
<i>Percent of lifetime in U.S.</i>	Less than 10% (n=22)	64	36	2.7 (1.0, 7.2)	5.0 (0.9, 30)	7.3 (1.7, 30)	5.7 (1.6, 20)	6.0 (1.4, 26)
	10% or more (n=76)	39	61	0.049	0.073	0.007	0.007	0.015
<i>Mammogram history</i>	1–2 years ago (n=12)	75	25	4.6 (1.2, 18)	4.4 (0.6, 35)			
	More than 2 years ago (n=38)*	39	61	0.029	0.163			
	Never(n=51)*	39	61					
<i>Family history of breast cancer</i>	Yes (n=7)	86	14	8.4 (1.0, 73)	5.1 (0.5, 59)	5.9 (0.7, 54)		7.0 (0.7, 70)
	No (n=84)	42	58	0.054	0.189	0.114		0.098
<i>Doctor recommended mammogram</i>	Yes (n=48)	50	50	1.7 (0.7, 3.8)	1.4 (0.4, 4.7)			
	No (n=48)	38	63	0.218	0.592			
<i>Have health insurance</i>	Yes (n=55)	35	66	0.4 (0.2, 0.9)	1.0 (0.2, 4.9)			
	No (n=40)	58	43	0.028	0.963			
<i>Have a regular doctor</i>	Yes (n=45)	33	67	0.5 (0.2, 1.0)	0.6 (0.1, 3.1)			
	No (n=53)	53	47	0.054	0.533			
<i>Embarrassed when get mammogram (post-test)</i>	Very or somewhat embarrassed (n=19)	42	58	0.9 (0.3, 2.6)				
	Other (n=82)	44	56	0.887				
<i>Importance of mammogram if no symptoms (post-test)</i>	Very important (n=62)	52	48	3.7 (1.4, 9.7)	7.3 (1.7, 31)	8.4 (2.2, 33)	6.9 (2.0, 24)	8.5 (2.2, 33)

Predictor		Completed Mammogram	Bivariate OR (95% CI) p- value	Multivar, All Vars with (n=73) p<0.25 OR (95% CI) p- value	Multivar, Best Subsets 1 (n=81) OR (95% CI) p- value	Multivar, Best Subsets 2 (n=90) OR (95% CI) p- value	Multivar, Best Subsets 3 (n=81) OR (95% CI) p- value
<i>Concern about radiation from mammogram (post-test)</i>	Somewhat or not important (n=39)	Yes % 31	No % 69	0.009	0.007	0.002	0.002
	Somewhat concerned (n=23)	39	61	0.8 (0.3, 2.0)			
	Not concerned (n=78)	45	55	0.626			
		mean $\pm$ s.d. 4.4 $\pm$ 1.8	mean $\pm$ s.d. 4.4 $\pm$ 1.2	1.0 (0.8, 1.3)			
<i>Breast cancer knowledge (one-point increase)</i>	Post-intervention	3.8 $\pm$ 0.5	3.6 $\pm$ 0.5	0.829	0.6 (0.2, 2.2)		
<i>Cultural scale (one-point increase towards more Western views)</i>	Post-intervention			1.7 (0.8, 3.8)	0.492		
<i>c concordance index</i>					0.80	0.74	0.77
<i>R²/max-rescaled R²</i>					0.28/0.37	0.22/0.30	0.25/0.34
<i>Mallow's Cp</i>					10.0	2.4	2.3

* Combined into reference group