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# Development and Evaluation of a Culturally Tailored Educational Video: Changing Breast Cancer–Related Behaviors in Chinese Women

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This study developed and evaluated a culturally tailored video guided by the health belief model to improve Chinese women's low rate of mammography use. Focus-group discussions and an advisory board meeting guided the video development. A 17-min video, including a soap opera and physician-recommendation segment, was made in Chinese languages. A pretest/posttest pilot was conducted to evaluate the efficacy of the video in changing knowledge, beliefs, and screening intentions among Chinese women (age  $\geq 40$ ) who were nonadherent to current National Cancer Institute's mammography guidelines ( $n = 52$ ). The results showed that the video significantly increased these women's screening intentions, knowledge, perceived risk for breast cancer, and perceived benefits of mammography. Chinese immigrant women were less likely to hold an Eastern view of health care and report barriers to screening after viewing the video. This video might have the potential to increase adherence to mammography screening in Chinese women.

**Keywords:** *culturally tailored video; Chinese women; breast cancer screening; health beliefs*

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Asian American women have the lowest rates of mammography use of all ethnic groups in the United States (Kagawa-Singer & Pourat, 2002; Lillie-Blanton, Rushing, & Ruiz, 2003; University of California, Los Angeles Center for Health Policy Research [UCLA-CHPR], 2005). Chinese American women have an even lower rate of screening than their Asian counterparts, such as Filipino, Japanese, and Vietnamese women (UCLA-CHPR, 2005). The low rate of mammography use in Chinese women might be associated with their demographic and cultural characteristics.

Chinese Americans are the largest Asian immigrant population in the United States, and 70.8% of this population is foreign-born (U.S. Census Bureau, 2000). More than 85% of Chinese Americans do not speak English at home, and up to 50% do not speak English fluently. Chinese Americans also have a higher poverty rate (13.5%) than the general U.S. and Asian populations (12.4% and 12.6%, respectively; Reeves & Bennett, 2004). Chinese Americans who are poor and have limited English proficiency are often reluctant to seek Western health care (Facione, Giancarlo, & Chan, 2000; Ma, 1999; Mo, 1992).

Chinese Americans also have different cultural practices of health care. They hold a holistic concept of health, believing that physical health is connected with emotional harmony and “chi” balance in the body. *Chi* is a Chinese concept of energy including yin-chi and yang-chi. According to this concept, excess of either type of chi may result in physical vulnerability (Hwu, Coates, & Boore, 2001). To achieve balance, people can practice self-care through consuming a yin-yang balanced diet, regular exercise, and having an optimistic state of mind (Holroyd, 2002; Liang, Yuan, Mandelblatt, & Pasick, 2004). Traditional Chinese also use Chinese therapeutic herbs in cooking to achieve yin-yang balance against diseases (Holroyd, 2002; Simpson, 2003). They believe that these self-care practices are natural and essential to prevent diseases. Several qualitative studies report that older Chinese women view Western biomedicine as efficient in treating disease but as having harmful side effects to the body (Facione et al., 2000; Holroyd, 2002; Liang et al., 2004). These Chinese cultural health beliefs may affect Chinese Americans’ tendencies to seek Western preventive screening, especially when they consider cancer as a fatal and unpreventable disease.

Research increasingly shows that, in addition to lack of insurance, underutilization of cancer screening in Chinese women is associated with Eastern cultural views of care, English deficiency, negative beliefs and attitudes, and low knowledge (Tang, Solomon, & McGracken, 2000; Tu et al., 2003; Wang et al., 2006; E. S. Yu, Kim, Chen, & Brintnall, 2001; M.Y. Yu, Hong, & Seetoo, 2003). For example, Chinese women who held Eastern views of health care and were less proficient in English were found to be less likely to have obtained a recent cancer screening (Tang et al., 2000; Wang et al., 2006; E. S. Yu et al., 2001). Chinese women were disinclined to seek cancer preventive care when they viewed themselves at lower risk of developing cancer (Facione et al., 2000; Tang et al., 2000; Tu et al., 2003), perceived less benefit of Western preventive care (Liang et al., 2004; National Cancer Institute (NCI), 1999; Stranghan & Seow, 2000; E. S. Yu et al., 2001), and had less knowledge and greater misconceptions about cancer and screening (Jackson et al., 2003; Liang et al., 2004; Wong-Kim, Sun, & Demattos, 2003; M.Y. Yu et al., 2003). Although these barriers are recognized as contributing to Chinese women’s lower use of cancer screening, there have been few intervention programs designed to reduce barriers to screening mammography and even fewer interventions that have been tailored to Chinese women’s cultural needs.

To fill this gap, we created a theoretically guided, culturally sensitive, and linguistically appropriate educational video for Chinese women to promote their use of mammography.

This video was designed to target both culturally specific barriers (e.g., Eastern cultural views of health care) and more general barriers (e.g., low perceived risk). We were guided by the health belief model (HBM) not only because the HBM components explain women's use of mammography (Aiken, West, Woodward, & Reno, 1994; Austin, Ahmad, McNally, & Steward, 2002), but also because the HBM addresses specific beliefs and barriers to cancer screening found in Chinese populations. Based on feedback from focus groups, we used a soap-opera style narrative in the video. This format has been successfully used to increase rates of mammography screening among African American, Hispanic, and White women (Davis et al., 1998; Jibaja et al., 2000) and Pap test screening among Chinese women (Taylor et al., 2002). Furthermore, based on extensive evidence documenting the impact of physician screening recommendations (Austin et al., 2002; Slenker & Grant, 1989; Smith, Phillips, & Price, 2001; Tang et al., 2000; Tu et al., 2003; Wang et al., 2006), we included a segment with a Chinese female physician recommending use of mammography for immigrant Chinese American women.

In this article, we present a preliminary evaluation of the video in a community sample of Chinese women who either had not ever had a mammogram or had not received a mammogram in the past 2 years (hereafter referred to as "nonadherent women"). We hypothesized that the video would reduce Chinese women's barriers to breast cancer screening and this, in turn, would increase their intention to obtain a mammogram.

## METHOD

This study was conducted in three phases: (a) a formative phase to identify the themes and format for the video, (b) a production phase that involved collaboration with our local Chinese communities and the video company, and (c) a quantitative phase that evaluated the acceptability and effectiveness of the video using a pretest/posttest design. The Institutional Review Board at Georgetown University approved this study.

### Formative Phase

We first conducted focus-group discussions to gain a firsthand understanding of Chinese women's culturally based views of breast cancer, attitudes toward mammography, and preferred content and format of the video intervention. Then we held an advisory board meeting consisting of Chinese community health leaders who have been involved in cancer care and Chinese women's health.

*Focus-Group Discussions.* We conducted four focus groups: two high-acculturation and two low-acculturation groups. Acculturation level was defined by the number of years (more or less than 10 years) in the United States and ability to speak English. Women with a U.S. residency greater than 10 years and proficiency in English were considered to be highly acculturated. Although other measures have been used to define the concept of acculturation, such as self-identification, lifestyle, friendship, and neighborhood (Burnam, Hough, Karno, Escobar, & Telles, 1987; Suinn, Ahuna, & Khoo, 1992), we used English-language fluency and U.S. residency as a proxy for acculturation because these markers have been widely used, easily assessed, and found to correlate highly with screening mammography use (O'Malley, Kerner, Johnson, & Mandelblatt, 1999; Yu, Seetoo, Tasi, & Sun, 1998). Furthermore, language proficiency

has been found to account for a large amount of the variance in acculturation (Anderson et al., 1993; Marin, Sabogal, Marin, Otero-Sabogal, & Perez-Stable, 1987), and length of residency is highly correlated with acculturation scales (Marin et al., 1987; Meredith, Wenger, Liu, Harada, & Kahn, 2000).

Eligibility criteria for all focus groups were women being aged 40 and older, having had no history of breast cancer, and never having participated in our previous projects. Women were recruited from various Chinese community activities through posted recruitment flyers and the Web sites of Chinese organizations in the metro D.C. area (including the District of Columbia and suburban Maryland and Northern Virginia). The 2000 census data indicates that approximately 60,000 Chinese live in this metro area (U.S. Census Bureau, 2000). Among these 60,000, approximately half are women and approximately 44% of these women are older than the age of 40. A total of 128 women responded to our calls for participation (4% responded to flyers and 96% from public events). Among the 128 women, 107 were eligible (84%). We randomly selected 20 highly acculturated and 20 low-acculturated women at different stages of mammography use (*ever*, *never*, and *regularly screened*) and assigned them to four focus groups (10 women per group). Women in each focus group had a similar distribution of screening stages. Efforts were made to ensure that each group had similar distribution of age.

Thirty-six of the 40 (90%) eligible women participated in the focus-group discussions. The two high-acculturation groups consisted of a total of 17 women (mean age = 46) who had lived in the United States for 13 years on average. The two low-acculturation groups included a total of 19 women (mean age = 58) who had been U.S. residents for a mean of 4 years. The high-acculturation groups were younger because there were few women older than the age of 50 who were highly acculturated. Each participant received a \$20 cash incentive after the group session.

In all focus groups, regardless of level of acculturation, participants reported feeling that they had less risk and threat for developing breast cancer (perceived susceptibility and seriousness) than White women. They were concerned that the radiation and pain from mammography would be harmful to the body (perceived benefits and barriers). They mentioned that natural approaches, such as eating healthy (i.e., Chinese diet with more vegetables and soy, less fried and junk food), exercising (i.e., chi-kung), and being optimistic were means to prevent cancer. Many low-acculturated women thought the use of a monthly self-examination plus natural approaches was sufficient to maintain their health. Those women who never or rarely went for mammograms said that they were healthy and unlikely to get cancer as they had not had any physical symptoms and family cancer history. Some thought that getting cancer was a function of genetics and body constitution, which is predestined. Many attributed breast cancer risk to the stresses that are associated with overcoming challenges in a new and different cultural environment and to changes in their dietary habits (e.g., eating more hormone-injected food like milk and chicken that might upset the balance of hormones in the body). Low-acculturated women stressed that long work hours, high medical costs in the United States, and difficulty in communication with Western practitioners greatly reduced their desire to obtain a mammogram. When asked about preferred educational modality, participants clearly favored a video that included recommendations from a physician along with real-life survivor stories.

*Advisory Board Meeting.* Advisory board members were subsequently convened to discuss the focus-group results and to identify appropriate themes and format of the video. They all had backgrounds in Chinese culture and were able to speak Mandarin.

The board included three medical professionals (an oncology nurse and two physicians), three Chinese American cancer-control researchers, four community health leaders, two breast cancer survivors, two representatives of the acting group, and a script writer who was a breast cancer survivor as well. Each board member was reimbursed \$50 dollars for their time.

The advisory board discussed a preliminary script that would connect the conceptual framework of HBM and the cultural views and barriers from the focus groups. Based on the discussions, the advisory group recommended a video consisting of two parts: a 10- to 12-min story targeting Chinese women's cultural beliefs and barriers to breast cancer control and a 5-min physician recommendation focusing on informational knowledge, clarification of misconceptions, and screening guidelines. They suggested that a suitable and engaging storyline for our Chinese audience incorporate a background of family and social support and have a humorous and positive tone. The script was developed and revised six to seven times in an iterative fashion, with the board providing feedback from each draft. We also revised the script based on cognitive laboratory testing in which we solicited other lay Chinese women's comments on the script. The script for the physician recommendation segment was developed in collaboration with the acting physician and researchers based on the focus group and board meeting results.

### **Production of the Video: Academic-Community Collaboration**

Building on a storyline about surviving breast cancer, a bilingual production team collaborated with local Chinese to produce the video. Performed by a Chinese drama club, the story opens with a surprise birthday party for a 50-year-old woman who had been diagnosed with breast cancer 5 years earlier. The ladies chatter about myths related to breast cancer and its early detection. Different beliefs and attitudes come forward in the narratives—from personal aversion to the experience of a mammogram to traditional Chinese views, especially those of husbands uneasy with the subject. The script is written to address Chinese sensitivities and concerns about cancer.

The actors rehearsed the script and discussed their performance with the leading researcher and director of the video producer. The video producer was experienced in filming health-related topics and had bilingual members with Chinese cultural background to direct the shooting. We used the house of a Chinese volunteer as our setting.

Following the narrative segment, a Chinese female physician reassured the viewers that breast cancer can be found early and that the cure rate of early-stage breast cancer is up to 90%. The physician used statistical resources to explain breast cancer risk in Chinese American women and a breast model to demonstrate how mammography can detect very small breast cancers that cannot be felt by hands. She stressed that early breast cancer is asymptomatic. Using clips of a mammography machine and film, she explained why it is necessary to compress the breasts during mammography. She emphasized that it is worth the brief discomfort of a mammogram to ensure breast health. She also provided comparisons to clarify that the amount of radiation exposure via mammography is too low to affect our health. At the end, the physician urged all women aged 40 and older to be screened and provided information about insurance coverage of mammography screening and county health programs where women could obtain a free or low-cost mammogram.

Both the actors and the physician spoke Mandarin while shooting. To reach more Chinese women, we created a dubbed Cantonese version. We also added English subtitles for the second-generation children to talk to their immigrant mothers about breast

cancer screening. The final video was 17 min in length and was produced in both DVD and VHS format.

### **Quantitative Phase: Process and Outcome Evaluation**

*Recruitment and Data Collection.* We conducted a pilot test of the video in a convenience sample of 52 Chinese American women who did not participate in the focus-group discussions. Women were recruited from the metro D.C. area following the same methods described in the focus-group section. Women were considered eligible if they were age 40 and older and nonadherent to the NCI screening mammography guidelines. We approached 225 women (97% on recruitment sites and 3% via telephone, as referred by their relatives and friends). Ninety of the 225 women met our criteria for eligibility, and 58% of the 90 ( $n = 52$ ) consented to participate in the study.

On receipt of consent, we interviewed participants via telephone to obtain baseline data. Then we mailed the video to the participants in response to their preference of a DVD or VHS format. Overall, 84% of the participants watched the Mandarin version and the rest viewed the Cantonese version. We contacted the women 2 weeks after mailing to confirm the receipt and viewing of the video. Women who had not viewed the video were reminded to do so. Participants were interviewed approximately 1 week after viewing the video. All surveys were conducted either in Mandarin or Cantonese. Two participants responded to the follow-up survey in English via e-mail because they were too busy to be interviewed via telephone. The baseline and follow-up interviews averaged 30 min. Participants completing both interviews received \$10 cash incentives.

All 52 women completed the baseline. However, 6 (12%) participants failed to complete the follow-up assessment because of their telephone being disconnected ( $n = 2$ ), being out of town during the follow-up period ( $n = 2$ ), inability to contact after 15 attempts ( $n = 1$ ), or being sick ( $n = 1$ ). Two participants who had a mammogram right after answering the baseline survey, but before seeing the video, were excluded. Thus, the final evaluation sample included 44 women for both pretests and posttests.

*Measure.* We used validated questionnaires to assess our primary outcome variable (mammography intentions) as well as barriers to cancer screening. Some baseline measures, including intention, knowledge, health beliefs, and cultural views, were repeated in the follow-up assessment to evaluate changes after intervention.

*Screening Intention.* We measured women's intention with the following question: "Do you plan to obtain a mammogram next year? Yes/No." In the follow-up interview, we also asked women to what extent the video has influenced their screening intention: *not at all, a little, some, very, or extremely.*

*Knowledge.* We measured knowledge of screening guidelines, breast cancer, and the advantages of mammography with 10 questions selected from several existing scales (Lobell, Bay, Rhoads, & Keske, 1998; Vaeth, 1993; Valdez, Banerjee, Ackerson, & Fernandez, 2002): for example, "Women over 40 years of age should have mammography every year (yes/no/don't know)." An overall knowledge score was calculated based on the number of correct answers to the questions. The response "don't know" was coded as an incorrect answer. A correct response was scored as 1. The overall knowledge scores ranged from 0 to 10 points.

*Cultural Views of Cancer and Health Care.* We selected two subscales (fatalism and self-care with alphas of .83 and .78, respectively) from a validated Chinese cultural scale to assess cultural views of care in our sample (Liang et al., in press). The scales were derived from a qualitative study of health views in Chinese women (Liang et al., 2004) and were predictive of their cancer-screening outcome (Wang et al., 2006). Participants responded to 12 items, such as “Getting cancer is like being sentenced to death” (fatalism, 9 items) and “I don’t visit doctors if I’m not feeling sick” (self care, 3 items), in a 5-point scale with the following responses: 1 = *strongly agree*, 2 = *agree*, 3 = *neutral*, 4 = *disagree*, and 5 = *strongly disagree*.

*Health Beliefs.* The Chinese Mammogram Screening Beliefs Questionnaire was used to measure Chinese women’s health beliefs about breast cancer and screening (Wu & Yu, 2003). Guided by the HBM, this scale is the only questionnaire measuring health beliefs targeted to Chinese American women aged 40 and older. The 33-item scale includes four subscales: Perceived Susceptibility, Seriousness, Benefit, and Barriers. The Perceived Barriers Scale was composed of three subcategories: discomfort, inconvenience, and access barriers (see detailed description in Wu & Yu, 2003). Women responded to the items ranging from *strongly agree* to *strongly disagree*. The Cronbach’s alpha for these subscales ranges from .77 to .90 in other Chinese population (Wu & Yu, 2003) and from .74 to .89 in our sample.

*English Proficiency.* We measured English proficiency in speaking, listening, reading, and writing using part of a well-established scale (Anderson et al., 1993). This scale has a reliability of .76 or greater. Participants responded to each item with the choices of *very well*, *good*, *fair*, *poor*, and *not at all*. We summed up the scores on four items to be an index of participants’ English proficiency. The four-item scale was reliable in our study sample with an alpha value of .97.

*Sociodemographic and Medical Factors.* We assessed demographics (i.e., age, education, marital status, income, and length of U.S. residency) and medical resources (including presence of health insurance coverage and a regular doctor).

*Process Evaluation.* We used open-ended questions to examine the acceptability of the video among participants. Based on the Center for Disease Control and Prevention (CDC) guidelines (AMC Cancer Research Center, 1994), we examined whether the video was clear in presentation, interesting, and easily understandable and had a logical sequence, familiar characters, realistic scenarios, and positive images. To measure whether the participants actually watched the video, we queried participants about items included in the video (i.e., the plot in the last scenario and the topics in the physician recommendation) in the follow-up interview. The open-ended questions were coded following the CDC guidelines.

## Data Analysis

We examined changes in screening intention, knowledge, health beliefs, and cultural views among 44 Chinese women. Missing values on continuous variables (including culture and health beliefs) at the baseline were imputed by substituting the grand mean. Missing values because of loss in contact and refusal to answer on the follow-up were

not imputed. For binary variables (screening intention), we used the McNemar test to examine the significance of intention changes. For continuous variables, we used paired *t* tests to examine the significance of pre or post changes. In follow-up analyses, we evaluated whether the impact of the intervention on knowledge, cultural views, and health beliefs was modified by key demographic and acculturation variables (see Table 1). To evaluate this, we conducted repeated measures analysis of variance. Although these analyses were exploratory, we retained the level of significance at  $p \leq .05$ , without adjustment, to identify potentially important associations that could be evaluated further in subsequent research. All analyses were performed using the Statistical Package for Social Science (SPSS-PC) version 12.0 (SPSS Inc., Chicago, IL).

## RESULTS

Table 1 summarizes other demographic characteristics of the study sample.

### Process Evaluation

Overall, 86% of participants reported that they liked the video. Participants said that the video was clear (100%), comprehensive (98%), interesting, and persuasive (84%) and that the plot in the video was realistic (87%). Eighty-nine percent of the women would recommend the video to others. Only 5% ( $n = 2$ ) said that their fear of breast cancer was increased after viewing the video, whereas 43% ( $n = 18$ ) said that their fear was decreased and 52% ( $n = 22$ ) remained the same. All respondents were able to recall characters and plot in the video and the content of the physician recommendations.

### Outcome Evaluation

Screening intentions increased from 37% at baseline to 88% at follow-up ( $p < .0001$ ). Among the 39 women who reported that they intended to get a mammogram after watching the video, 89% ( $n = 30$ ) indicated that their intention was a result of watching the video. Furthermore, 73% of these women reported that the video had influenced their intention *extremely* or *very much*. Significant increases of intention were evident in all subgroups based on history of mammography, age, educational level, income, presence of insurance and regular doctors, length in the United States, and English proficiency (see Table 1).

The video also increased participants' knowledge, Western cultural views, perceived risk about breast cancer, and perceived benefits of mammography (see Table 2). Knowledge scores increased from a mean of 7.36 at baseline to 8.43 at follow-up ( $p = .001$ ). There was an improvement on each individual knowledge item except the item "breast cancer increases with family history." The mean score of this item decreased 1.4 points from the baseline; that is, some women who thought that breast cancer increases with family history at baseline did not believe the statement at the follow-up. This may be a result of the physician's message in the video clarifying that about 75% of women having breast cancer do not have any genetic reason or family history.

Women who watched the video also exhibited a significant reduction in their Eastern views of cancer and health care. After viewing the video, they were less likely to endorse the beliefs that cancer is a fatal disease and a result of personal fate and that they do not need to visit doctors when they are healthy and maintain good lifestyles.

Table 1. Changes in Intention to Obtain a Mammogram Before and After Viewing the Video

	<i>n</i>	%	Pre-Intention	Post-Intention	% Change	<i>p</i> Value
			Yes (%)	Yes (%)		
All women	43 <sup>a</sup>	100	37.2	88.4	51.2	.000
Mammogram						
Ever, but > 2 years	22	52	31.8	90.9	59.1	.000
Never	21	48	42.9	85.7	42.8	.012
Age <sup>b</sup>						
40 to 59	21	49	33.3	85.7	52.4	.001
60-plus	22	51	40.9	90.9	50	.003
Education						
College	22	52	18.2	86.4	68.2	.000
≤ High school	21	48	57.1	90.5	33.4	.039
Income						
≤ \$20,000	26	59	38.5	88.5	50	.001
> \$20,000	17	41	35.3	88.2	52.9	.004
Health insurance						
Yes	27	64	40.7	85.2	44.5	.000
No	16	36	31.3	93.8	62.5	.006
Having regular MD						
Yes	18	42	55.6	88.9	33.3	.031
No	25	58	24.0	88.0	64	.000
Years in U.S.						
< 10 <sup>c</sup>	15	35	46.7	100	53.3	
≥ 10	28	65	32.1	82.1	50	.001
English proficiency						
Low	22	52	45.5	90.9	45.4	.006
High	21	48	28.6	85.7	57.1	.000

a. One missing value in the baseline, so the total *N* was 43.

b. The mean age of the sample was 58 years, ranging from 41 to 75 years old (standard deviation = 10.19).

c. Significant test was missing because one cell remains constant and could not be computed.

Three of the four subvariables of the Health Belief Scale exhibited significant changes from baseline to follow-up. Only mean scores on perceived seriousness did not significantly change. In terms of decreasing specific barriers, the video significantly reduced women's concern about the pain and radiation effects from mammography, inconvenience (i.e., too busy to visit doctors), and access barriers.

In the repeated measures analyses, we evaluated the following variables to determine whether they modified the impact of the intervention: mammography history, age, education level, income, insurance status, having a regular physician, years in the United States, and English-language proficiency. Results from these analyses showed that several variables were associated with pre and post changes in our key outcomes of knowledge, cultural views, and health beliefs. As shown in Table 3, prior screening status was associated with changes in knowledge ( $p = .05$ ) and perceived seriousness of breast cancer ( $p = .01$ ). Specifically, the video led to greater increases in knowledge and perceived seriousness among participants who had never been screened (mean difference [ $\Delta$ ] = 1.66 and 3.72, respectively) compared to participants who had previously been screened

Table 2. Mean Differences in Knowledge, Cultural Views, and Health Belief Variables and Their Subscales Before and After Viewing the Video

Factors	<i>n</i>	Pre-Mean Score	<i>SD</i>	Post-Mean Score	<i>SD</i>	<i>p</i> Values <sup>a</sup>
Knowledge	44	7.36	1.88	8.43	1.40	.001
Cultural views	38	38.55	6.56	45.53	7.73	.000
Fatalistic	38	30.05	5.68	34.76	6.70	.000
Self-care	44	8.61	2.36	10.75	3.05	.000
Perceived susceptibility	41	10.25	2.22	12.24	2.19	.000
Perceived seriousness	29	26.16	2.17	27.66	4.12	.080
Perceived benefits	43	23.72	1.80	27.93	3.31	.000
Perceived barriers <sup>b</sup>	34	44.65	8.42	31.09	8.88	.000
Access barriers	40	19.62	4.37	15.28	5.69	.000
Discomfort	40	15.29	3.56	10.03	3.84	.000
Inconvenience	40	10.18	2.43	6.8	2.99	.000

NOTE: The number of *N* varied because there were different missing values in each variable in the follow-up data. High mean scores means that women had higher knowledge, more Western views of care (lower fatalistic views and self care), were more susceptible to breast cancer, and felt more seriousness about getting breast cancer, except that higher means scores on perceived barriers indicates more barriers to obtain a mammogram. *SD* = standard deviation.

a. The *p* values were determined by the paired *t* tests.

b. The total respondents to the whole Perceived Barrier Scale were 34 women; however, there were 4 different or same respondents who did not answer some of the questions in each subscale.

Table 3. Mean Differences in Repeated Measures of Knowledge and Perceived Seriousness Scales by Mammography History and Income Status

	Mammogram History							
	Ever Screened				Never Screened			
	<i>M</i> <sub>1</sub>	<i>SD</i> <sub>1</sub>	<i>M</i> <sub>2</sub>	<i>SD</i> <sub>2</sub>	<i>M</i> <sub>1</sub>	<i>SD</i> <sub>1</sub>	<i>M</i> <sub>2</sub>	<i>SD</i> <sub>2</sub>
Knowledge	7.83	1.44	8.35	1.53	6.86	2.20	8.52	1.23
Perceived seriousness	26.38	1.56	26.06	4.39	25.90	2.79	29.62	2.82
	Income Status							
	High income (> \$20,000)				Low income (≤ \$20,000)			
	<i>M</i> <sub>1</sub>	<i>SD</i> <sub>1</sub>	<i>M</i> <sub>2</sub>	<i>SD</i> <sub>2</sub>	<i>M</i> <sub>1</sub>	<i>SD</i> <sub>1</sub>	<i>M</i> <sub>2</sub>	<i>SD</i> <sub>2</sub>
Knowledge	8.33	1.41	8.67	1.75	6.69	1.89	8.27	1.12
Perceived seriousness	25.95	2.32	25.42	4.14	26.31	2.11	29.24	3.38
Perceived benefit	23.77	2.11	26.56	4.34	23.68	1.60	28.92	1.85

NOTE: *M*<sub>1</sub> was denoted as pretest mean score and *M*<sub>2</sub> was posttest mean score, same for *SD*<sub>1</sub> and *SD*<sub>2</sub> (*SD* = standard deviation).

( $\Delta = .52$  and  $-.32$ , respectively). Similarly, income was associated with differential changes in knowledge ( $p = .03$ ), perceived seriousness ( $p = .04$ ), and perceived benefit ( $p = .02$ ). Specifically, women with greater than \$20,000 annual income had a smaller increase in knowledge and perceived seriousness scores ( $\Delta = .34$  and  $-.53$ , respectively) compared to women with lower incomes ( $\Delta = 1.58$  and  $2.93$ , respectively), and low-income

women had greater increases in perceived benefits ( $\Delta = 5.24$ ) compared to high-income women ( $\Delta = 2.79$ ).

## DISCUSSION

Results from this process and outcome evaluation suggest that a culturally tailored video guided by HBM is well accepted by immigrant Chinese women who have never, or not recently, had a mammogram. After viewing the video, these nonadherent women significantly increased their knowledge and intentions to obtain a mammogram and reduced their cultural and attitudinal barriers to use of mammography. These results support our hypothesis that a theoretically guided and culturally sensitive educational video is useful to increase breast cancer awareness and reduce barriers to breast cancer screening.

Similar to other minority populations (Austin et al., 2002; Slenker & Grant, 1989; Smith et al., 2001), Chinese women perceive low breast cancer risk, fewer benefits of mammography, and concerns about radiation, pain, and embarrassment. Moreover, Chinese women possess culturally based fatalistic views and Eastern views of health care. Unlike African American and Hispanic women who stress the role of God in causation and curability of cancer (Austin et al., 2002; Holt, Clark, Kreuter, & Rubio, 2003; Kinney, Emery, Dudley, & Croyle, 2002; Pérez-Stable, Sabogal, Otero-Sabogal, Hiatt, & McPhee, 1992), Chinese women view cancer as predetermined by personal luck or fate (including body constitution); one can do less to reduce risk if meant to get cancer in one's life destiny (Stranghan & Seow, 2000). On the other hand, the Chinese believe that diet has a profound effect on cancer, believing that many diseases are caused by what one eats, drinks, and digests in the body (Simpson, 2003). Low-aculturated participants even suggested that the video could contain more dietary recommendations for cancer prevention. They also believe that exercise helps keep the chi and blood in good circulation that maintains body vitality (Simpson, 2003). These low-aculturated women favor natural approaches over medical examinations as the former is more fundamental to prevent diseases than the latter, especially when the examination may cause unnecessary harm to the body and when one does not feel sick or have symptoms. Thus, although fatalistic views and self-care are also the correlates of other minority women's screening behaviors (Austin et al., 2002; Facione, Miaskowski, Dodd, & Paul, 2002; Powe & Finnie, 2003), it seems that there are different connotations underlying these constructs across different ethnic groups. Cross-cultural studies with in-depth investigation of how these health beliefs vary from different cultural groups may benefit our efforts in implementation of effective health education to promote better health outcomes.

The effect of this video seems to be fairly similar across different demographic groups of Chinese women. However, our exploratory analyses suggest that the video intervention may have a greater effect in increasing knowledge and perceived seriousness among women who have never had a mammogram and had low income ( $\leq \$20,000$ ). There is considerable overlap among these groups, with 65% of never-screened women ( $n = 21$ ) reporting an annual income of less than \$20,000. Overall, these women were also older, had poor English ability, and were less likely to be insured. These constraints may have limited these women's ability to obtain information about early detection of breast cancer and further understand their risk for breast cancer. This is consistent with our focus-group results and prior research (Facione et al., 2000; Ma, 1999; Mo, 1992)

suggesting that women who are poor and less acculturated are least likely to seek Western medical information and service. As a result, our linguistically and culturally appropriate breast cancer educational video may have been providing new information to these women. As a result, the video may have alerted these women to the seriousness of breast cancer and of the importance for early detection. These results raise the possibility that the video intervention may be most beneficial to those women who are the most underserved. However, these results should be interpreted cautiously given the post hoc nature of these analyses and the low sample size. We plan to further evaluate these variables in future randomized trials that are sufficiently powered to detect such moderators of the intervention effect. Overall, our results suggest that the increase in screening intention rates may be mediated by changes in knowledge, health beliefs, and Eastern views of care. However, this small pilot does not have sufficient power for a full examination of such mediation effects; this is an important focus of our future work.

Our findings support previous research in other populations, showing that health communication via a video tool is effective in educating women about breast cancer and screening mammography (Davis et al., 1998; Drindel, Brown, Caplan, & Blumenthal, 2004; Yancey, Tanjasiri, Klein, & Tunder, 1995). Although other culturally sensitive soap-opera videos show moderate effects in improving attitudes and beliefs in other minority women (Drindel et al., 2004; Jibaja et al., 2000; Valdez et al., 2002), our video shows strong effects in promoting positive attitudes toward breast care among Chinese women. We attribute the success of this video to the cohesive integration of a theoretical framework and active community involvement. Also, distinct from other video programs (Davis et al., 1998; Jibaja et al., 2000), we included a culturally valued medical authority—a physician articulating to the viewers why adherence to breast cancer–screening guidelines is important. This might have greatly enhanced the effect of our video. Culturally tailored intervention programs are often considered more competent in health communication than nonculturally tailored programs (Springton & Champion, 2004). In fact, little research has studied the extent to which culturally tailored materials outweigh nontailored materials. Future research comparing culturally tailored and conventional approaches will be needed.

There are several caveats that should be considered in assessing our results. First, our relatively low participation rate (58%) raises the possibility of participation bias and may limit the generalizability of our results. Thus, the results of our study might not be generalized to other Chinese populations. In addition, our focus groups and evaluation sample were recruited on a voluntary basis; that is, those who participated might be different from the general target population, such as being more interested in watching a video or having less attitudinal barriers to mammography in the first place. Hence, the preliminary results of this study will need to be confirmed by testing the effect of this video in a broader Chinese population. With a small sample size, we also could not perform multivariate analysis to determine which variables were independently associated with our outcomes. Also, because of time and funding constraints, our evaluation design could not include actual mammography utilization and we were unable to include a control group. Lack of a comparison group limits any conclusions that we can draw about the efficacy of this video. The significant increase in intention to obtain a mammogram after viewing the video may be partly because of the effect of social desirability. It is possible that participating women would give their positive responses to encourage our effort in promoting breast cancer awareness and prevention. Finally, we also found that some portions of the physician recommendation confused women about the relationship between family history and breast cancer risk. Further modification of the message (such as

stressing that women with family history of breast cancer have higher risk for developing breast cancer than women without) will be needed to correct this confusion.

Despite these limitations, this study has implications for how to promote health communication within Asian populations. First, this video was rigorously created in correspondence to prior research findings, culturally valued elements, and a strong conceptual framework (HBM). Second, we used a community-partnered approach to develop the video. Our preliminary evaluation of this video provides scientific support that this approach is important in the development of a culturally appropriate educational program for Chinese or Asian populations. Third, the results of our outcome evaluation suggest that this culturally tailored educational video is instrumental in reducing knowledge as well as attitudinal and cultural barriers in nonadherent Chinese women and should promote adherence to breast cancer screening. This video is the first theoretically guided and culturally tailored media program to counter barriers to mammography use in Chinese women of which we are aware. Our next step is to conduct a randomized controlled trial to examine the efficacy of this video in promoting adherence to mammography-screening guidelines in a broader community population. Our preliminary findings suggest that this video has the potential to reduce disparities in breast cancer screening in this large immigrant minority population.

### Implications for Practitioners

It might be premature to give clinical implications for practitioners as this study was a preliminary evaluation of the educational video and was based on a small sample of immigrant Chinese women. However, the results of this study suggest that a medical professional's explanation is able to modify Chinese women's misconceptions and negative attitudes toward Western preventive care. Communications between practitioners and patients might be facilitated when practitioners are sensitive to culturally based views of health care held by immigrant, low-aculturated women. In addition, this video seems to be a useful tool to educate Chinese patients about breast cancer and screening mammography. Practitioners and health educators might play a culturally tailored video about health issues in their clinical settings (i.e., waiting room) to enhance their medical communication with Chinese patients.

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