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14. ABSTRACT

The purpose of this study is to develop and use culturally appropriate and stage-tailored Chinese language breast cancer brochures to promote older Chinese-American women's intentions to obtain mammography. A three-year research plan is designed to pursue this purpose. In Year 1, the brochures were developed and refined based on previous findings of cultural and language barriers to breast cancer screening in Chinese women. In Year 2, two-hundred and fifty Chinese women aged 50 and older in the Washington DC area completed a telephone interview regarding their previous screening experience, cultural views, and screening barriers. Participants were randomly assigned to either an intervention group with stage-tailored brochures or a control group with standard brochures. In Year 3, we mailed the appropriate set of materials to participants and conducted process and outcome evaluations of the intervention materials. Two-hundred and twenty of the 250 participants have completed the follow-up assessment. Due to a delay in collecting the follow-up data, we have been granted a no-cost extension to finish analysis of follow-up data in the next year. Based on preliminary results of and experience with this project, the PI has successfully competed with peer-reviewed grants to continue her professional development and prevention research in Chinese women.

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DOD Cancer Development Award
Year two progress report

Research title: Impact of culture on breast cancer screening in Chinese-American women

I. Introduction

Breast cancer is the most common cancer for Chinese-American women and is the second leading cause of cancer death in this group.[1] Research has consistently shown that Chinese-American women have the lowest rate of mammography screening among minority and ethnic groups[2-5] and that Chinese-American women are more likely to be diagnosed with greater tumor size.[6-7] However, few studies have presented systematic understanding about how these barriers connect to screening and what type of intervention is effective in promoting screening within this population. To expand current limited knowledge about Chinese women and their intentions to get screening, the proposed study aims to investigate cultural and language barriers to breast cancer screening among Chinese women. We will also conduct a brochure intervention to promote breast cancer screening in this underserved population. The objectives of this study are threefold: 1) conduct a baseline interview with older Chinese women to identify cultural and language barriers to mammography screening; 2) develop culturally appropriate Chinese language educational materials targeted by stage of adoption; and 3) conduct a process evaluation of the potential impact of these tailored materials on screening intention in this under-studied population. Based on information from the baseline interview, we refined culturally tailored Chinese breast cancer brochures. A randomized trial in a sample of 250 Chinese women was conducted to assign participants to either read the culturally tailored brochures (intervention group) or read a simple fact sheet (control group). We have analyzed the baseline data and conducted process and outcome evaluation of the intervention materials. Since we have just completed follow-up assessment, we will not be able to conclude the effect of the brochure intervention on increasing Chinese women's intention to use mammography in this report. However, we have been granted a no-cost extension by the DoD to carry out follow-up data cleaning and analysis tasks in the next year.

II. Body

The following outlines the progress made in the third year toward meeting objectives specified for the study. The specific aims of the study are as follows:

1. Use quantitative research methods to describe factors related to older Chinese women's breast cancer screening behaviors.

2. Develop and test culturally and stage-tailored educational materials designed to improve screening use in this population.

Progress Report September 1, 2004 – August 31, 2005

II.1 Task 5. Implement the intervention (Month 25-30)

II.1.a Mail standard Chinese breast cancer educational materials to participants in the control and culturally-and stage-tailored Chinese breast cancer educational materials to participants in the intervention group. In the first and second years, we had successfully recruited more than 250 consenting women from the Metropolitan DC area to participate in this study and 250 of the consenting women had completed baseline interviews via telephone. The 250 participants were then randomized into an intervention group (reading culturally and staged tailored brochure at home, N =125) or a control group (reading a standard fact sheet in Chinese language at home, N = 125). The detailed information about recruitment, baseline surveys, interview procedures, and randomization had been described in the first and second annual reports. In this report, we are describing the progress of our project in the third year.

We mailed appropriate sets of brochures to participants in each group at the start of the third year. The intervention materials were characterized by the stage of adoption: 1) Never brochure-"Have you ever had a mammogram" for women who had never had a mammogram, 2) Ever brochure-"It's time for a mammogram"- for women who had ever had a mammogram, but did not regularly obtain a mammogram, and 3) Regular brochure-"Keep getting regular mammography" for women who have regularly obtained a mammogram for every 1-2 years. Each woman in the intervention group received an appropriate brochure pertaining to never, ever, or regular screening stages. The stages of adoption were based on the women's responses to baseline survey questions about history of screening mammography. The categorization of stage of adoption had been clearly described in the second report. Women in the control group all received a standard fact sheet.

II.1.b Conduct progress evaluation interviews 2 weeks after the initial mailed intervention to ascertain the success of intervention, acceptability of the educational materials, and participants' intention for breast cancer screening. We conducted follow-up assessment two weeks after mailing the materials to participants. First, we asked the participant whether she had received the material that was sent two weeks ago. If she said yes, the trained interviewers then asked whether she had read the brochure. If she read the brochures, we would subsequently conduct the follow-up assessment via telephone if she was also available at the time. If she had not yet read the brochure, we reminded her to read the brochure and made an appointment with her for the follow-up interview. For those who did not receive the brochures, we re-confirmed their address and sent the brochures to them again. About 25% of the women reported that they did not receive the materials from the first mailing. Most of these women indicated that their address was correct, but they just did not receive it or they forgot where they had placed it. In any case, we re-sent the materials to ensure that all the participants received the materials to read.

The follow-up assessment focuses on women's future screening intentions and perceptions of the clarity, layout, format, and the literacy level of the materials (See the follow-up survey in Appendix A). The details regarding finalization, translation, and pilot test of process evaluation of the follow-up questionnaire had been described in the second year's progress report and approved by the Georgetown Institutional Review Board.

At this stage, we experienced difficulties in collecting follow-up data from participating women and this has caused a significant delay in our proposed schedule for data analysis of this project. Such delay resulted from difficulties in finding participating women to be interviewed and making an appointment with them for interviews. For example, some women were out of town from few weeks to several months so that we could not reach them until their return. For some women who were too busy to read the brochures, we waited until they were available to be interviewed. Some women's phone numbers were disconnected. Then, we tried all means (i.e. writing a letter, soliciting information from these women's friends and relatives, and identifying the associations where these women were recruited) to find out their new contact information. After trying, we dropped off those who could not be reached at all. Overall, 30 out of the 250 participants including 14 women in the control group and 16 in the intervention group withdrew from the follow-up assessment. The reasons for withdrawal included loss of contact (n = 5), no longer being interested in participation (n = 9), moving out of the area (n = 6), being too busy (n = 3), being died and sick (n = 2), and pending in contact at the time (n = 5). To date, we have completed follow-up interviews with the remaining 220 women including 111 women in the control group and 109 in the intervention group. A preliminary analysis indicated that there are no significant differences in age, educational level, marital and employment statuses, and presence of insurance coverage and a regular doctor between the control and intervention groups in the follow-up. There are no differences in these demographic and medical care factors between women withdrew from the control and in the intervention group.

In the follow-up assessment, women were interviewed mostly in Mandarin, Cantonese, and Taiwanese by using the Computer Assisted Telephone Interview. Only two participants preferred to be interviewed in English.

Fourteen participants who had difficulty in answering questions by telephone were interviewed in person. The follow-up interview took about 35 minutes on average. All data are stored in our secure servers in a confidential fashion. Participants were only identified by a unique ID number.

II.2 Task 6. Analyze data and conclude the project, Month 25-36.

II.2.a Analyze the baseline (Months 25-30) and process evaluation data (Months 28-33) according to specific aims. The analysis of our baseline data was connected to a larger trial (PI: Dr. Wenchi Liang), part of that study also investigates the impact of culture on breast, cervical, and colon cancer screening. Dr. Liang is also a collaborator of this current project. We aggregated breast cancer data from these two projects to form a larger dataset with a sample size of 507 women who completed baseline surveys. This aggregation enables us to have adequate analysis power to investigate associations between cultural factors and breast cancer screening. In the baseline analysis, we excluded those women who reported that they obtained mammography because of health problems. Thus, the final study sample consisted of 466 women. We divided our outcome variable into two categories: regular mammography screeners and non-regular screeners. Regular screeners included women who had a mammogram in the past year and had a previous mammogram within two years prior to the most recent test. Women who had mammograms beyond this time frame or who never had the tests were considered non-regular screeners. We hypothesized that women who are more likely to have Eastern view of health care and who have lower English ability are less likely to be regular screeners.

We used chi-square tests and t-tests to examine bivariate associations between outcome variable, predictors (i.e. culture and language), and covariates (i.e. demographic and medical access factors). We utilized logisitic regression for multivariate analysis. The data analyses were performed by the SAS 9.1 program. We have written up the baseline results into a manuscript entitled "Culture, Language Ability, and Breast Cancer Screening in older Chinese Women" (see Appendix B). This manuscript is currently under review by our other research team members and will be submitted to publish in the next few months. In this report, we summarized major findings as below.

Sample characteristics. Of the 446 participants, 443 were foreign born. Only three women were born in the U.S, but they were raised up in a Chinese-speaking environment. Among the foreign-born women, 64% were born in China, 3% in Hong Kong, 29% in Taiwan, and 4% in other countries including Singapore and Vietnam. The mean age of the sample was 64.5 years, ranging from 50 to 89 (standard deviation, SD = 9 years). The majority of participants had a college degree or higher (68%), had health insurance (77%), and was married (73%). Thirty-seven percent were employed. Fifty-three percent of the participants were classified as regular screeners.

Bivariate associations. Women who reported to have had regular mammography were significantly more likely to be younger ($p < .0001$), highly educated ($p < .0001$), and employed ($p < .0001$) than those not having regular mammograms. Compared to those not having regular mammograms, women who had regular mammograms were also more likely to worry about getting breast cancer ($p < .0001$), perceive a higher risk of getting breast cancer ($p < .0009$), have health insurance ($p < .0001$), receive physician recommendation ($p < .0001$), and have higher English ability ($p < .0001$). They were less likely to perceive access barriers ($p < .0001$), receive encouragements from family and friends for mammography ($p = .0171$), and hold Chinese cultural views of health and illness ($p < .0001$).

Multivariate analysis. Results from logistic regression support our study hypotheses. Women who hold an Eastern view of care were less likely to be regularly screened (OR=0.96, 95% C.I. = 0.94~0.99), controlling for other covariates. That is, for every 1 point increase in the cultural scale, the odds of being regular screeners were 4% less than being non-regular screeners. Similarly, with each increase of the English ability scale, there was a 43% increase in regular use of mammography (OR=1.43, 95% C.I. = 1.10~1.86). We also analyzed the relationships between sub-cultural scales (fatalism and self-care) and screening outcome. The effects of

fatalism and self-care sub-scales on regular mammography use were both significant (OR=0.98, 95% C.I. = 0.97~0.99), and OR=0.99, 95% C.I. = 0.98~0.99, respectively), after controlling for sociodemographics and other important factors to cancer screening practice.

Our baseline results indicate that Chinese American women had much lower rate of using mammography screening (53%) and this is consistent with other reports[8,9] and a recent report of California Health Interview Survey.[10] Our results suggest that this low rate of use is associated with cultural and language factors independently of other covariates. Therefore, culturally sensitive and linguistically appropriate intervention programs are important to educate Chinese women about breast cancer and to increase their participation in screening mammography.

To overcome cultural and language barriers, we have designed culturally sensitive, linguistically appropriate, and stage-tailored brochures for this underserved minority population. We have distributed appropriate sets of brochures to our sample (n =220) and have conducted process evaluation to examine the success of intervention, acceptability of the educational materials, and participants' intention for breast cancer screening. Since we have just finished collecting follow-up data due to some difficulties stated above (see explanation in Section II.1.b), we will not be able to present the results of process evaluation in this report. However, we have been granted a one-year no-cost extension for this project. We will immediately start to clean the dataset and conduct process and outcome evaluations of the intervention in the next year.

III. Key Research Accomplishments

- Successfully distributed appropriate sets of brochures to participating women based on their stages of adoption and the group they belong to after randomization.
- Maintained a strong relationship with Chinese communities in the Metropolitan Washington DC area and obtained their assistance in identifying those women who lost in the follow-up.
- Conducted follow-up assessment and successfully interviewed with 220 Chinese women who remained in the study after baseline survey.
- Kept the data in a confidential fashion without connecting any personal information such as name, address, and telephone.
- Analyzed the baseline data in a larger sample size to examine associations between cultural factors and utilization of mammography screening.
- Wrote up the baseline results into an abstract and manuscript to disseminate the findings.

IV. Reportable Outcomes

- The P.I. has co-authored two abstracts: one abstract presenting our baseline results regarding cultural impact on breast cancer in the 2005 Era of Hope meeting held in Philadelphia, Pennsylvania in June, 2005, and the other abstract regarding physician recommendation and screening outcomes presented in the meetings of the American Society of Preventive Oncology held in San Fransico, California, and Behavioral Society of Medicine, Boston, Massachusetts in March 2005. (Abstracts were included in Appendix C). This work was supported by this DoD award.

- With the support from the DoD cancer development award, the P.I. has collaborated with other researchers to co-write several papers to disseminate research findings of this project and other related projects. One manuscript entitled "Influence of culture and cancer worry on colorectal cancer screening among older Chinese women" will be published by the Ethnicity and Disease in 2006 (see Appendix D). Another manuscript describing the development of the cultural scale measuring Chinese Americans' views of health care were re-submitted to Health Education and Behavior in August 2005 (see Appendix E). The baseline

results of this project pertaining to cultural impact on breast cancer screening have been written up into a manuscript and are currently in preparation for submission to publish (see Appendix B).

- Utilizing knowledge and experience gained from the current project, the P.I. has led a research team to successfully create a breast cancer educational video for Chinese women based on the fund from the Susan G. Komen Foundation National Race for the Cure. This video was designed to target those who lack knowledge about breast cancer and mammography, lack of understanding of western preventive care, and do not adhere to mammography screening guidelines. Benefiting from a strong tie with Chinese communities that was built up in the DoD study period, the P.I. received an extensive support from the communities throughout the course of production of the video.

- Based on baseline data, four separate grant proposals entitled "Promoting adherence to mammography use in Chinese American women" were submitted to the Susan G. Komen Breast Cancer Foundation in August 2004, the American Cancer Society (ACS) in October 2004, and the National Cancer Institute K07 and R03 awards in 2004. The P.I was honored to receive three awards including the Komen Special Population grant, ACS Mentored Research Scholar Grant, and the NCI R03 grant. With the support from these funds, the P.I. will launch a larger randomized control trial to examine efficacy of multimodality intervention (Culturally tailored video plus brochures used in this project) on increasing adherence to mammography use among Chinese women verse video only and verse brochures alone.

V. Conclusions

We have completed three major tasks in the third year including distribution of intervention materials, collection of follow-up data, and analysis of baseline data. Our baseline results show that Chinese women in the metro DC area had a much lower rate in utilization of mammography screening compared to other ethnic groups; only 53% of the women regularly obtained mammography. This is a far lag behind our national goal to have 70% regular screening toward year 2010. Our results have also revealed that Chinese women's regular access to use mammography is related to their cultural views about cancer and care. For example, women who believe that cancer is a fatal disease are less motivated to regularly obtain mammography. Women with Eastern cultural views rely more on self-care and prefer not to visit doctors unless they are sick. Lack of proficient English ability is also detrimental to seeking information about cancer care and obtaining timely mammography screening provided in the U.S. Therefore, interventions designed to counter cultural and language barriers are particularly important in our mission. We have taken these barriers into consideration to create our brochures with clarification of misconceptions about breast cancer and with emphasis of the benefits from preventive screening. We have collected qualitative and quantitative data about participants' feedback on the brochures from the follow-up assessment. We will analyze these data to evaluate whether the brochures are acceptable and effective in increasing knowledge about breast care and intention to receipt of recent mammography. These results will inform us how we can educate Asian Americans about cancer and further reduce health disparity in cancer.

By working on this research project, the P.I. has gained her knowledge about cancer control and prevention from a public health and epidemiological perspective. The P.I. has also strengthened her skills in designing and conducting intervention research in Asian American populations. With a deeper understanding of socio-cultural influence on cancer screening behavior, the P.I. was able to design a more dynamic communication tool such as the breast cancer drama video and to successfully compete with peer-reviewed research funding such as the three awarded grants stated above. All of these are valuable for the P.I.'s professional development and aid her growth to become an independent cancer control scientist.

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Appendix A

Follow-up questionnaires (English and Chinese)

IMPACT OF CULTURE ON CANCER SCREENING IN CHINESE WOMEN

FOLLOW-UP SURVEY

Georgetown University

Subject ID# _____

Introduction

Hello, Mrs. [SUBJECT]. I am [INTERVIEWER], calling from Georgetown University for the project on Chinese American women's cancer education. The purpose of this phone call is to know what you think about the Chinese language educational materials that we sent to you a couple weeks ago. Your opinions will be used to improve these materials, which will benefit other Chinese American women your age. The interview will last for about 15-20 minutes, and all the information you give us will be kept confidential. Do you have time now?

[If NO] May I set up an appointment with you to call you back for this interview?
[Record the appointment date and time in the table.]

Appointments:

Date	Time	Spoke with	Call back date	Call back time	Interviewer
/ /	am/pm			am/pm	
/ /	am/pm			am/pm	
/ /	am/pm			am/pm	

[If YES] Do you have any questions before we start? [If NO, continue onto the next page.]

REMINDER: Code "777" for non-applicable questions; "888" for "Don't know/Unsure," and "999" for "Do not want to answer/Refusal."

Telephone Call Tracking Sheet

Multiple tries:

Date	Time 1		Time 2		Time 3		Time 4		Interviewer
/ /	am pm	B N	am pm	B N	am pm	B N	am pm	B N	
/ /	am pm	B N	am pm	B N	am pm	B N	am pm	B N	
/ /	am pm	B N	am pm	B N	am pm	B N	am pm	B N	
/ /	am pm	B N	am pm	B N	am pm	B N	am pm	B N	
/ /	am pm	B N	am pm	B N	am pm	B N	am pm	B N	

B=Line busy; N=No answer.

FINAL DISPOSITION: ____ (1-Completed; 2-Not able to contact; 3-Wrong number)

DATE: ____ / ____ / 20 _____

INTERVIEWER: _____

SECTION I Evaluation of the Mailing of the Educational Materials

Let us start with the educational materials that we sent to you by mail a couple weeks ago.

1. Have you received the Chinese language educational materials?

Yes (Skip to 2).....01
No.....02

1.1. We are sorry that you did not get the materials.
May I ask whether your mailing address is [READ MAILING ADDRESS]?

[RECODE]
Correct address 01
Incorrect address (STOP; Go to "Offer a second mailing")....02

1.2. Do you have any ideas why you did not receive this package? (Explore other ways the materials can reach the participant. Mail it again if necessary)

_____

2. Do you think mailing you these materials is a good way to provide you information with cancer and cancer screening? Please let us know for any suggestions that you may have about this method.

_____

****

[Offer a second mailing]
Mrs. [Name], for some reasons we did not have your correct mailing address. However, we will be very happy to mail you another sets of Chinese cancer screening materials. Could you please tell me your current mailing address?

Name: _____ Relationship: _____

Address: _____

City _____ State _____ Zip_____

Telephone: ( ) _____

Thank you very much. We'll mail out the materials in a few days. After you review these materials, we'll contact you again in one or two weeks to ask about your opinions about these materials. Bye-Bye.

Note: If the participant cannot spell the address in English: Ask whether someone in the house can help out. Offer to call back to speak to whoever is capable of providing the participant's address.

SECTION II Evaluation of Cancer Screening Educational Materials

Now, I would like to ask for your opinions regarding the educational materials. The opinions you share will not involve right or wrong answers. Your opinions are the most useful and helpful information for us to improve the materials.

1. What did you think the topics of these materials were about?

2. Do you think these materials provide you enough information about how to prevent breast, cervical, and colorectal cancers?

   Yes. Comments:_____

   No. Reasons: _____

3. Is there anything you didn't understand? Please tell me **which part and why** you didn't understand.

   Yes.....1

   Breast Cancer _____

   Cervical Cancer _____

   Colorectal Cancer _____

   No.....2

4. Did you have any opinions about reading these educational materials regarding the font, content, color, pictures, and length of the materials. We will ask you one by one. Please share your opinions with us.

   Font _____

   Content _____

   Color _____

   Pictures (including graphics) _____

   Length _____

5. What did you like most about these educational materials?

6. What did you like least about these educational materials?

7. What are the things in the materials you would like to add or delete?

   Add: _____

   Delete: _____

8. Do you think that these educational materials reflect any Chinese thoughts you can identify with?

   Yes 01
   No 02

   8.1. Please tell us why you think so. (Please give one or two examples such as sentences and/or pictures)

   _____

9. Would you read these materials whenever you need information about breast, cervical, and colorectal cancer ?

   Yes 01
   No (To 9.1) 02

   9.1 Please explain: _____

10. Would you recommend that your friends and family read these materials?

    Yes 01
    No 02

11. Compare to other cancer materials you read before, do you think the materials we designed will better help you to be aware of cancer?

Yes 01
No 02

12. Overall, how useful do you think these materials would be to other Chinese American women like you? [READ CATEGORIES]

Extremely useful 01
Very useful 02
Somewhat useful 03
Not very useful 04
Not useful at all 05

SECTION III Cancer Knowledge and Screening Experience

This section asks about your opinions about cancer and experiences with and opinions of several screening tests for breast, cervical, and colorectal cancers.

[Cancer knowledge] (*NHIS, 1992*)
1. Do you think [RISK FACTOR] is a risk factor for [CANCER NAME]?
[CIRCLE ONE RESPONSE]

Cancer	Increased age	High fat diet	Low fiber diet	Smoking	Family history	Exercise
Breast	Yes/No/DK	Yes/No/DK	Yes/No/DK	Yes/No/DK	Yes/No/DK	Yes/No/DK
Cervical	Yes/No/DK	Yes/No/DK	Yes/No/DK	Yes/No/DK	Yes/No/DK	Yes/No/DK
Colorectal	Yes/No/DK	Yes/No/DK	Yes/No/DK	Yes/No/DK	Yes/No/DK	Yes/No/DK

[Code: Yes=1, No=0]

1.1 Do you think having multiple sexual partners is a risk factor for Cervical Cancer?

Yes.....01
No.....02
Don't know/Unsure.....888
Refused to answer.....999

2. The following statements are opinions about cancer screenings other women your age may have. Please tell me if you strongly agree, agree, disagree, strongly disagree, or are neutral to each of the statements. [*Rakowski, 1997*]

Statements	SA	A	N	DA	SD	Unknown
2.1 I would be more likely to go for cancer screening if my doctor told me how important it was.	1	2	3	4	5	6
2.2 Regular cancer screening gives you peace of mind about your health.	1	2	3	4	5	6
2.3 I worry that cancer screening has a high chance of leading to surgery that is not needed.	1	2	3	4	5	6
2.4 Cancer screening is necessary even when there is no history of cancer in a family.	1	2	3	4	5	6
2.5 I would probably not have cancer screening if my doctor seemed to doubt that I really needed one.	1	2	3	4	5	6
2.6 If cancer screening finds something, then whatever is there will be too far along to do anything.	1	2	3	4	5	6
2.7 If I eat a healthy diet, I will lower my risk of getting cancer far enough that I probably do not need to go for cancer screening.	1	2	3	4	5	6
2.8 Cancer screening is not important for a woman my age.	1	2	3	4	5	6

2.9 Once you have a couple of cancer screening results that are normal, you don't need to have any more for a few years.	1	2	3	4	5	6
2.10 I would probably not go for cancer screening unless I had some symptoms or discomfort.	1	2	3	4	5	6
2.11 Cancer screening finds cancer at a point when it is more likely to be cured.	1	2	3	4	5	6
2.12 Cancer screening is not as important as people say it is.	1	2	3	4	5	6
2.13 I would probably not have cancer screening unless I got a reminder from my doctor.	1	2	3	4	5	6
2.14 Having a mammogram every year or two will give me a feeling of control over my health.	1	2	3	4	5	6
2.15 If I have a breast exam from a doctor or nurse, I don't need to have a mammogram.	1	2	3	4	5	6
2.16 Mammograms are most helpful when you have one every year or two.	1	2	3	4	5	6
2.17 A Pap test can be done so quickly that it is not a bother to have one.	1	2	3	4	5	6
2.18 A Pap test can find a problem even before it develops into cancer.	1	2	3	4	5	6
2.19 Pap test results cannot be trusted because some labs that do the tests are better than others.	1	2	3	4	5	6
2.20 A Pap test is most helpful when you have one every year or two.	1	2	3	4	5	6
2.21 Women who reach menopause do not need Pap tests very often.	1	2	3	4	5	6
2.22 After women stop having children they do not need Pap tests.	1	2	3	4	5	6
2.23. A blood stool test involves a series of unpleasant procedures that I have to do myself.	1	2	3	4	5	6

SA=Strongly agree; A=Agree; N=Neutral; DA=Disagree; SD=Strongly disagree.

3. How often do you think women your age should have a mammogram?

Recall correctly (Once a year).....01
Recall incorrectly.....02

4. How often do you think women your age should have a Pap smear?

Recall correctly (Once a year).....01
Recall incorrectly.....02

5. How often do you think women your age should have a blood stool test?

Recall correctly (Once a year).....01
Recall incorrectly.....02

6. How often do you think women your age should have a flexible sigmoidoscopy?

Recall correctly (Once a year).....01
Recall incorrectly.....02

7. How often do you think women your age should have a colonoscopy?

Recall correctly (Once a year).....01
Recall incorrectly.....02

Section IV Cancer Screening Experience / Future Screening Intentions

The following questions ask about your experience in cancer screening.

[MAMMOGRAPHY]

1. Do you plan to have a mammogram in the next year?

Yes (To 1.1.) 01
No (To 1.3.) 02

1.1. Would you say that your decision to have a mammogram in the next year was made after reading the educational materials we gave you?

Yes (To 2) 01
No 02

1.2. What are other factors, such as information from the doctor's office, contributing to your decision to have a mammogram in the next year? [Check all that apply]

Doctor's recommendation 01
Having being regularly getting screening 02
Family members' encouragement 03
Information from newspapers, magazines 04
Encouragement from friends 05
Insurance coverage 06
Family history 07
Existing disease 08
Other, specify: _____ 09

1.3. What are your reasons for not planning to have a mammogram? [Check all that apply]

Lack of transportation 01
Difficulty in getting an appointment 02
Language barrier (hard to find a doctor speaking Chinese) 03
No time 04
No paid leave 05
My doctor did not recommend 06
I don't think I will get breast cancer 07
I'm too old for it 08
I had previous negative results 09
It's embarrassing 10
Lack of a babysitter 11
No or only partial insurance coverage 12
Too much paperwork 13
Long waiting time 14
Unpleasant prior experience 15
Too many restrictions (diet) 16
Other, specifiy;_____ 17

[PAP SMEAR]

2. Do you plan to have a Pap test in the next year?

Yes (To 2.1.).....01
No (To 2.3.).....02

2.1. Would you say that your decision to have a Pap test in the next year was made after reading the educational materials we gave you?

Yes (To 3).....01
No 02

2.2. What are other factors, such as information from the doctor's office, contributing to your decision to have a Pap test in the next year? [Check all that apply]

Doctor's recommendation 01
Having being regularly getting screening 02
Family members' encouragement.....03
Information from newspapers, magazines 04
Encouragement from friends.....05
Insurance coverage.....06
Family history 07
Existing disease 08
Other, specify: _____ 09

2.3. What are your reasons for not planning to have a Pap test? [Check all that apply]

Lack of transportation.....01
Difficulty in getting an appointment 02
Language barrier (hard to find a doctor speaking Chinese).03
No time.....04
No paid leave 05
My doctor did not recommend.....06
I don't think I will get cervical cancer.....07
I'm too old for it.....08
I had previous negative results.....09
It's embarrassing.....10
Lack of a babysitter 11
No or only partial insurance coverage.....12
Too much paperwork.....13
Long waiting time 14
Unpleasant prior experience.....15
Too many restrictions (diet).....16
Other, specifiy;_____ 17

[FOBT]

3. Do you plan to have a blood stool test in the next year?

Yes (To 3.1.).....01
No (To 3.3.).....02

3.1. Would you say that your decision to have a blood stool test in the next year was made after reading the educational materials we gave you?

Yes (To 4).....01
No 02

3.2. What are other factors, such as information from the doctor's office, contributing to your decision to have a blood test in the next year? [Check all that apply]

Doctor's recommendation 01
Having being regularly getting screening 02
Family members' encouragement.....03
Information from newspapers, magazines 04
Encouragement from friends.....05
Insurance coverage.....06
Family history 07
Existing disease 08
Other, specify: _____ 09

3.3. What are your reasons for not planning to have a blood stool test? [Check all that apply]

Lack of transportation.....01
Difficulty in getting an appointment 02
Language barrier (hard to find a doctor speaking Chinese) .03
No time.....04
No paid leave 05
My doctor did not recommend.....06
I don't think I will get colorectal cancer.....07
I'm too old for it.....08
I had previous negative results.....09
It's embarrassing.....10
Lack of a babysitter 11
No or only partial insurance coverage.....12
Too much paperwork.....13
Long waiting time 14
Unpleasant prior experience.....15
Too many restrictions (diet).....16
Other, specifiy;_____ 17

[FLEXIBLE SIGMOIDOSCOPY]

4. Do you plan to have a flexible sigmoidoscopy in the next year?

Yes (To 4.1.).....01
No (To 4.3.) 02

4.1. Would you say that your decision to have a flexible sigmoidoscopy in the next year was made after reading the educational materials we gave you?

Yes (To 5).....01
No 02

4.2. What are other factors, such as information from the doctor's office, contributing to your decision to have a flexible sigmoidoscopy in the next year? [Check all that apply]

Doctor's recommendation 01
Having being regularly getting screening 02
Family members' encouragement 03
Information from newspapers, magazines 04
Encouragement from friends 05
Insurance coverage.....06
Family history 07
Existing disease 08
Other, specify: _____ 09

4.3. What are your reasons for not planning to have a flexible sigmoidoscopy? [Check all that apply]

Lack of transportation.....01
Difficulty in getting an appointment 02
Language barrier (hard to find a doctor speaking Chinese) .03
No time.....04
No paid leave 05
My doctor did not recommend.....06
I don't think I will get colorectal cancer.....07
I'm too old for it.....08
I had previous negative results.....09
It's embarrassing.....10
Lack of a babysitter 11
No or only partial insurance coverage.....12
Too much paperwork.....13
Long waiting time 14
Unpleasant prior experience.....15
Too many restrictions (diet).....16
Other, specifiy;_____ 17

[COLONOSCOPY]

5. Do you plan to have a colonoscopy in the next year?

Yes (To 5.1.).....01
No (To 5.3.) 02

5.1. Would you say that your decision to have a colonoscopy in the next year was made after reading the educational materials we gave you?

Yes (To 6).....01
No 02

5.2. What are other factors, such as information from the doctor's office, contributing to your decision to have a colonoscopy in the next year? [Check all that apply]

Doctor's recommendation 01
Having being regularly getting screening 02
Family members' encouragement.....03

Information from newspapers, magazines 04
Encouragement from friends 05
Insurance coverage.....06
Family history 07
Existing disease 08
Other, specify: _____ 09

5.3. What are your reasons for not planning to have a colonoscopy? [Check all that apply]

Lack of transportation.....01
Difficulty in getting an appointment 02
Language barrier (hard to find a doctor speaking Chinese) .03
No time 04
No paid leave 05
My doctor did not recommend.....06
I don't think I will get colorectal cancer.....07
I'm too old for it.....08
I had previous negative results.....09
It's embarrassing.....10
Lack of a babysitter 11
No or only partial insurance coverage.....12
Too much paperwork.....13
Long waiting time 14
Unpleasant prior experience.....15
Too many restrictions (diet).....16
Other, specifiy;_____ 17

6. Since our last contact, has your health insurance coverage changed?

Yes 01
No (Go to next section) 02

6.1 What is your health care coverage now? [Check all that apply]

Medicare.....01
Medicaid 02
HMO 03
Private insurance.....04

SECTION III Health Status

This survey asks for your views about your health. This information will help you keep track of how you feel and how well you are able to do your usual activities.

1. Overall, how would you rate your health in the past year?

Excellent 01
Very good 02
Good.....03
Fair 04
Poor.....05
Very poor.....06
Don't know/Unsure.....888
Refuse to answer.....999

3. During the past year, how much did physical health problems limit your usual physical activities (such as walking or climbing stairs)?

Not at all.....01
Very little.....02
Somewhat 03
Quite a lot.....04
Could not do physical activities 05
Don't know/unsure.....888
Refuse to answer.....999

4. During the past year, how much difficulty did you have doing your daily work, both at home and away from home, because of your physical health?

Not at all.....01
A little bit.....02
Some.....03
Quite a lot.....04
Could not do daily work.....05
Don't know/unsure.....888
Refuse to answer.....999

5. How much bodily pain have you had in the past year?

None.....01
Very mild 02
Mild.....03
Moderate 04
Severe.....05
Very severe.....06
Don't know/unsure.....888
Refuse to answer.....999

6. During the past year, how much energy did you have?

Very much 01
Quite a lot 02
Some 03
a little 04
None 05
Don't know/unsure 888
Refuse to answer 999

7. During the past year, how much did your physical health or emotional problems limit your usual social activities with family or friends?

Not at all 01
Very little 02
Somewhat 03
Quite a lot 04
Could not do social activities 05
Don't know/unsure 888
Refuse to answer 999

8. During the past year, how much have your been bothered by emotional problems (such as feeling anxious, depressed, or irritable)?

Not at all 01
Slightly 02
Moderately 03
Quite a lot 04
Extremely 05
Don't know/unsure 888
Refuse to answer 999

9. During the past year, how much did personal or emotional problems keep you from doing your usual work, school, or other daily activities?

Not at all 01
Very little 02
Somewhat 03
Quite a lot 04
Could not do daily work 05
Don't know/unsure 888
Refuse to answer 999

Section IV Intervention Strategy Probe

1. If we hold a series of classes offering your more information about the risk of cancer and how we can prevent cancer by professionals and discussion from participants, would you like to attend?

Yes.....01
No (go to 1.1) 02

1.1 Could we know why you don't like to attend?

_____

2. Where would you like the classes being held? [Check all that apply]

Community service center 01
Senior Center 02
Church.....03
Home.....04
Local school 05
The place your work.....06
Clincs.....07
Don't know/unsure.....888
Refuse to answer.....999

3. If we make a video with a soap opera format targeting issues on breast, cervical, and colorectal cancers, would you like to have one to watch at home?

Yes.....01
No (go to 1.1) 02

Thank you very much for taking your time completing this interview. It has been a pleasure talking to you. If you have any questions regarding this study and your participation, please contact Mrs. Mei-Yuh Chen at Georgetown University; her work number is (202) 687-0155. We will contact you again in the next 1-2 years to see how you are doing.

Thanks. Bye.

MAKING AN APPOINTMENT WITH YOUR HEALTH
與健康有約

FOLLOW-UP SURVEY

喬治城大學

研究對象代號# _____

前言

您好， [某某某]女士. 我是 [電話訪問員]，從喬治城大學『與健康有約』婦女健康研究計劃打電話給您。 您還記得今年___月份時我打電話給您，談到了您對健康的看法。我們大概在兩個禮拜前寄給您一份中文的教材。我想要和您談談您對這份中文教材的看法。您的意見可以用來改善我們的教材，並幫助和您差不多年紀的婦女。這次電話訪談大概需要 20-30 分鐘，您提供給我們的資料會絕對保密。您現在有時間嗎?

[假如 沒時間] 我可以和您約別的時間進行訪談嗎?
[假如可以，在表格中填入訪談的日期和時間]
[假如不可以，跳到下面拒絕欄表格]

Appointments:

Date	Time	Spoke with	Call back date	Call back time	Interviewer
/ /	am/pm			am/pm	
/ /	am/pm			am/pm	
/ /	am/pm			am/pm	

拒絕欄:
您可不可以告訴我爲什麼您不想要參加這個研究嗎? [逐字紀錄]

RECODE→
太忙了.....01
身體很不舒服.....02
沒有興趣.....03
覺得訪談時間太長了.....04
對做訪談有負面的反應.....05
個人隱私.....06
其他 (請註明)_____ 07

[假如 有時間] 在我們訪談開始之前，您有沒有問題要問? [假如沒有，翻到下一頁]

備註: 代碼 "777" 表示這是不適用的問題; "888" 表示 "不知道/不確定," 以及 "999" 表示 "不想回答/拒絕回答."

Telephone Call Tracking Sheet

Multiple tries:

Date	Time 1		Time 2		Time 3		Time 4		Interviewer
/ /	am pm	B N	am pm	B N	am pm	B N	am pm	B N	
/ /	am pm	B N	am pm	B N	am pm	B N	am pm	B N	
/ /	am pm	B N	am pm	B N	am pm	B N	am pm	B N	
/ /	am pm	B N	am pm	B N	am pm	B N	am pm	B N	
/ /	am pm	B N	am pm	B N	am pm	B N	am pm	B N	

B=Line busy; N=No answer.

FINAL DISPOSITION: ____ (1-Completed; 2-Not able to contact; 3-Wrong number)

DATE: ____ / ____ / 20 _____

INTERVIEWER: _____

第一部份　郵寄教材的評值

我們就從幾個禮拜前寄給您的教材開始。 它是裝在一個黃色的信封袋裡面，裝有三份中文教材。您記得嗎？您可以把它拿出來看嗎？

1. 您有收到乳癌、子宮頸癌及大腸直腸癌中文的教材嗎?

有（跳到第 2 題）.....01
沒有 02

1.1. 我們很抱歉，您沒有收到這份教材。
請問您的住址是不是[唸出住址]？

[RECODE]
住址正確.....01
住址不正確（停住; 跳到 "提供再次郵寄"）.....02

****

[提供再次郵寄]
[xxx]女士，我們很抱歉沒有您正確的住址。我們想要再寄一份中文的防癌教材給您。可以請問您目前的住址嗎?

住址: _____

城市名 _____ 州 _____ 郵遞區號_____

非常謝謝您。我們在幾天內便會將教材寄給您。並過幾個禮拜後再和您聯絡，請問您對於這些教材的意見。再見。

備註:假如參與者無法拼出英文住址: 請尋求他的家人幫忙。 或說，會再打電話來詢問她的家人。

第二部份　　防癌教材的評值

現在，我想要請問您對於這份教材的意見。所有的答案都沒有對或錯。 您的意見都很寶貴，可以有效地幫助我們來改善這份教材。

1. 您最喜歡這些教材的哪一個部份？

2. 您最不喜歡這些教材的哪一個部份？

3. 您希望增加或刪除教材中的那些部份？

增加_____

刪除_____

4. 有任何地方您不了解的嗎? 請告訴我**哪個部分**以及**為什麼**您不了解。

有.....1

乳癌 _____

子宮頸癌_____

大腸直腸癌 _____

沒有.....2

5. 我們想請問您對於這些教材的字體、內容、顏色、照片以及教材的長度上有沒有什麼意見。請告訴我您對每一項目的意見是非常不好、不好、很好、非常好，或是普通(還可以)。也請您告訴我們您的建議。

	非常不好	不好	普通	很好	非常好	建議
字體	01	02	03	04	05	
內容	01	02	03	04	05	
顏色	01	02	03	04	05	
照片(包括圖形)	01	02	03	04	05	
教材的長度	01	02	03	04	05	

《Code》非常不好(01)、不好(02)、很好(03)、非常好(04)，或是普通(05)

6 您認為這份教材能夠反映出任何您可以認同的中國人的想法嗎？

是.....01
否.....02

請告訴我們為什麼您這麼想。(請舉一或二個例子。譬如，句子以及／或者是圖片)

_____

7. 當您需要關於乳癌、子宮頸癌、以及大腸直腸癌的資料時，您會再讀這份教材嗎?

會.....01
不會 (跳到 7.1).....02

7.1 請說明原因: _____

8. 您會推薦您的朋友或家人閱讀這份教材嗎？

會.....01
不會.....02

9. 您以前讀過其他防癌的教材嗎？

有.....01
沒有.....02 〔跳到 11〕

10. 和其他您所讀過的癌症教材相比較，您認為我們寄給您這份教材的資訊是比較多、比較少、或者是一樣多？

內容較多.....01
一樣多.....02
內容較少.....03
從未讀過其他的教材.....777
不知道/不確定.....888
拒絕回答.....999

11. 整體來說，您認為這份教材對其他華裔婦女有多大的用處？[讀出選項]

有用極了.....01
非常有用.....02
有些有用.....03
不怎麼有用.....04
完全沒有用處.....05

12. 從哪裡您可以獲得健康方面的訊息？ [可複選]

醫生.....01
朋友和家人.....02
電視.....03
收音機.....04
電腦 (網路).....05
雜誌.....06
報紙.....07
健康博覽會.....08
書.....09
手冊，請註明_____.....10
其他，_____.....11

第三部份　癌症知識以及癌症檢查的意願

這部份想要請教您對癌症檢查的意見。

[癌症知識] (*NHIS, 1992*)

1. 您認為 [危險因子] 是導致 [癌症名稱] 的一個原因嗎?
[從中圈選一個答案]

癌症名稱	年紀愈大	常食用高油脂飲食	常食用低纖維飲食	抽煙	家族病史	缺乏運動
乳癌	是/否/不知道	是/否/不知道	是/否/不知道	是/否/不知道	是/否/不知道	是/否/不知道
子宮頸癌	是/否/不知道	是/否/不知道	是/否/不知道	是/否/不知道	是/否/不知道	是/否/不知道
大腸直腸癌	是/否/不知道	是/否/不知道	是/否/不知道	是/否/不知道	是/否/不知道	是/否/不知道

[Code: 是=1, 否=0]

1.1 您認為有多位性伴侶是造成子宮頸癌的一個原因嗎?

是.....01
否.....02
不知道/不確定.....888
不願回答.....999

2. 像您這個年紀的婦女應該多久做一次乳房攝影檢查?

1年1次.....01
每1到2年1次.....02
其他(請註明_____).....03
不需要做乳房攝影檢查 04
不知道/ 不確定.....888
拒絕回答.....999

3. 像您這個年紀的婦女應該多久做一次子宮頸抹片檢查?

1年1次.....01
每1到2年1次.....02
其他(請註明_____).....03
不需要做子宮頸抹片檢查 04
不知道/ 不確定.....888
拒絕回答.....999

4. 像您這個年紀的婦女應該多久做一次糞便潛血檢查?

1年1次.....01
每1到2年1次.....02
其他(請註明_____).....03
不需要做糞便潛血檢查了 04
不知道/ 不確定.....888
拒絕回答.....999

5. 像您這個年紀的婦女應該多久做一次軟式乙狀結腸鏡檢查?

每5年1次.....01
其他 (請註明_____).....02
不需要做軟式乙狀結腸鏡檢查了 03
不知道/ 不確定.....888
拒絕回答.....999

6. 像您這個年紀的婦女應該多久做一次大腸鏡檢查?

每 5年1次.....01
每10年1次.....02
其他(請註明_____).....03
不需要做大腸鏡檢查了 04
不知道/ 不確定.....888
拒絕回答.....999

7. 請問您在未來的一年內有做乳房攝影檢查的計畫嗎?

有 01
沒有 (跳到 7.3.).....02
不確定/可能會,請註明原因_____.....888

7.1. 是什麼因素使您決定去做乳房攝影檢查? [可複選]

醫師的建議.....01
已有定期做檢查的習慣 02
家人的鼓勵.....03

報紙、雜誌的訊息.....04
電視得到的訊息.....05
朋友的鼓勵.....06
保險有給付.....07
有家族病史.....08
看了您們給我的教材.....09
經過和電話訪問員談過話以後.....10
乳房方面有毛病.....11
其他。請註明:_____.....12

[選項 10 只適用於接受電話諮商組的婦女們]

7.2. 我們的這份教材對幫助您決定要去做乳房攝影檢查的影響有多大？[讀出選項]

非常大.....01
很大.....02
有一些.....03
只有一點.....04
一點都沒有.....05

[跳到第 8 題]

7.3. 您不想做乳房攝影檢查的原因是什麼? [可複選]

	是	否
7.3.1 沒有交通工具	01	02
7.3.2. 很難預約到看診時間	01	02
7.3.3 語言上的障礙（很難找得到會說英文的人陪我去做檢查）	01	02
7.3.4 沒有時間	01	02
7.3.5 我的醫師沒有建議要做	01	02
7.3.6 我不認為我會得到乳癌	01	02
7.3.7 我已經老了，指出原因_____	01	02
7.3.8 以前的檢查結果都是正常	01	02
7.3.9 很難為情	01	02
7.3.10 沒有或只有部分的醫療保險給付	01	02
7.3.11 等候做檢查時間太久	01	02
7.3.12 以前做乳房攝影檢查的經驗很不好	01	02
7.3.13 以前做乳房攝影檢查的經驗很痛	01	02
7.3.14 其他，請註明;_____	01	02

8. 請問您在未來的一年內有做子宮頸抹片檢查的計劃嗎？

有 01
沒有 (跳到 8.3.) 02
不確定/可能會，請註明原因_____.. 888

8.1. 是什麼因素使您決定去做子宮頸抹片檢查？ [可複選]

醫師的建議.....01
已有定期做檢查的習慣 02
家人的鼓勵.....03
報紙、雜誌得到的訊息 04
電視得到的訊息.....05
朋友的鼓勵 06
保險有給付 07
有家族病史 08
看了您們給我的教材 09
經過和電話訪問員談過話以後.....10
子宮頸有毛病 11
其他。請註明 : _____.....12

[選項 10 只適用於接受電話諮商組的婦女們]

8.2. 我們的這份教材對幫助您決定要去做子宮頸抹片檢查有多大的影響？

非常大.....01
很大 02
有一些.....03
只有一點 04
一點都沒有 05

[跳到第 9 題]

8.3. 您不想做子宮頸抹片檢查的原因是什麼? [可複選]

	是	否
8.3.1 沒有交通工具.....	01	02
8.3.2. 很難預約到看診時間	01	02
8.3.3 語言上的障礙（很難找得到會說英文的人陪我去做檢查）.....	01	02
8.3.4 沒有時間.....	01	02
8.3.5 我的醫師沒有建議要做	01	02

8.3.6 我不認為我會得到子宮頸癌 01 02
8.3.7 我已經老了，指出原因_____..... 01 02
8.3.8 以前的檢查結果都是正常 01 02
8.3.9 很難為情..... 01 02
8.3.10 沒有或只有部分的醫療保險給付 01 02
8.3.11 等候做檢查時間太久 01 02
8.3.12 以前做子宮頸抹片檢查的經驗很不好 01 02
8.3.13 其他，請註明;_____ 01 02

9. 請問您在未來有做腸癌檢查的【腸癌檢查項目】的計劃嗎？

9.1 糞便潛血檢查
有 01
沒有 02
不確定/可能會，請註明原因_____.....888

9.2 軟式乙狀結腸鏡檢查
有 01
沒有 02
不確定/可能會，請註明原因_____.....888

9.3 大腸鏡檢查
有 01
沒有 02
不確定/可能會，請註明原因_____.....888

[假如 9.1,9.2, 及 9.3 所有的回答都是〝沒有〞，跳到 9.6；任何一個或以上的回答〝有〞，則跳到 9.4]

9.4 是什麼因素使您決定去做腸癌檢查？ [可複選]

醫師的建議.....01
已有定期做檢查的習慣 02
家人的鼓勵.....03
報紙、雜誌得到的訊息 04
電視得到的訊息.....05
朋友的鼓勵 06
保險有給付 07
有家族病史 08
看了您們給我的教材 09
經過和電話訪問員談過話以後.....10
大腸方面有毛病 11
其他。請註明 : _____.....12

[選項 10 只適用於接受電話諮商組的婦女們]

9.5 我們的這份教材對幫助您決定去做腸癌檢查有多大的影響？

非常大.....01
很大 02
有一些.....03
只有一點 04
一點都沒有 05

[跳到第 10 題]

9.6. 您不想做腸癌檢查的原因是什麼? [可複選]

	是	否
9.6.1 沒有交通工具.....	01	02
9.6.2. 很難預約到看診時間.....	01	02
9.6.3 語言上的障礙（很難找得到會說英文的人陪我去做檢查）.....	01	02
9.6.4 沒有時間.....	01	02
9.6.5 我的醫師沒有建議要做.....	01	02
9.6.6 我不認為我會得到腸癌.....	01	02
9.6.7 我已經老了，指出原因_____	01	02
9.6.8 以前的檢查結果都是正常.....	01	02
9.6.9 很難為情.....	01	02
9.6.10 沒有或只有部分的醫療保險給付.....	01	02
9.6.11 等候做檢查時間太久.....	01	02
9.6.12 以前做糞便潛血檢查的經驗很不好.....	01	02
9.6.13 以前做軟式乙狀結腸鏡檢查的經驗很不好	01	02
9.6.14 以前做大腸鏡檢查的經驗很不好.....	01	02
9.6.15 限制太多（飲食方面）.....	01	02
9.6.16 其他，請註明;_____	01	02

10. 以下是婦女對於做乳癌、子宮頸癌，及大腸直腸癌三種癌症檢查可能有的看法。 請告訴我您對這些敘述是非常贊同、贊同、不贊同、非常不贊同，沒意見，或是不知道。 [*Rakowski, 1997*]

敘述	非常贊同	贊同	沒意見	不贊同	非常不贊同	不知道
10. 1 如果您的醫師告訴您癌症檢查的重要性, 您會比較想要去做癌症檢查。	1	2	3	4	5	6
10. 2 定期做癌症檢查能讓您對您的健康感到放心。	1	2	3	4	5	6
10. 3 您耽心做癌症檢查，很有可能導致不必要的手術。	1	2	3	4	5	6
10. 4 即使家中沒有人得過癌症, 還是有必要做癌症檢查。	1	2	3	4	5	6
10. 5 假如您的醫師好像不確定是否您需要做癌症檢查, 您可能不會想做。	1	2	3	4	5	6
10. 6 假如癌症檢查發現了不正常, 那麼不管做什麼都於事無補。	1	2	3	4	5	6
10. 7 假如您吃的食物很健康, 那麼您得到癌症的機會就會降低很多, 您可能就不需要去做癌症檢查。	1	2	3	4	5	6
10. 8 對像您這樣年紀的婦女來說，癌症檢查並不重要。	1	2	3	4	5	6
26. 9 一旦您有幾次正常的癌症檢查結果, 之後的幾年就不需要再做了。	1	2	3	4	5	6
10. 10 除非有症狀出現或感到不舒服，您大概不會想去做癌症檢查。	1	2	3	4	5	6
10. 11 癌症檢查可以在癌症最有可能被治好的時候就發現。	1	2	3	4	5	6
10. 12 癌症檢查並沒有像大家說得那麼重要。	1	2	3	4	5	6
10. 13 您可能不會做癌症檢查，除非您的醫師提醒您。	1	2	3	4	5	6
26. 14 每一兩年做一次癌症檢查使您覺得您能夠掌握自己的健康。	1	2	3	4	5	6
10. 15 假如醫師或護士幫您檢查過您的乳房, 您就不需要去做乳房攝影檢查了。	1	2	3	4	5	6
26. 16 每一年或二年做一次乳房攝影檢查，對您是最有幫助的。	1	2	3	4	5	6
10. 17 子宮頸抹片檢查很快就可以做好了，做這種檢查不是一種困擾。	1	2	3	4	5	6
10. 18 子宮頸抹片檢查能夠在癌症尚未發展之前，就能發現問題。	1	2	3	4	5	6
10. 19 子宮頸抹片檢查的結果並不可靠，因為有些檢驗室做的檢查比其他檢驗室來的好。	1	2	3	4	5	6
26. 20 每一年或二年做一次子宮頸抹片檢查，對您是最有幫助的。	1	2	3	4	5	6
10. 21 停經後的婦女不需要經常做子宮頸抹片檢查。	1	2	3	4	5	6
10. 22 在婦女停止生育之後，她們不需要做子宮頸抹片檢查。	1	2	3	4	5	6
10. 23. 做糞便潛血檢查要您自己取得糞便樣本，真是噁心。	1	2	3	4	5	6
10. 24 大腸鏡檢查前要吃瀉藥幫助排便，讓您覺得很不舒服。	1	2	3	4	5	6
10. 25 做腸癌檢查前很多東西都不能吃，真是麻煩。	1	2	3	4	5	6

SA=非常贊同; A=贊同; N=沒意見; DA=不贊同; SD=非常不贊同

11. 從上次我們打電話給您後，您的健康醫療保險有變更過嗎？

是 01
否 (跳到第四部分).....02

11.1 您現在投保的是哪一種健康醫療保險計劃呢? [可複選]

聯邦醫療保險 (Medicare).....01
低收入戶/傷殘者醫療保險 (Medicaid) 02
聯邦醫療保險 (Medicare) 及 Supplemental（附加保險） .02
一般醫療保險組織 (HMO) 03
其他私人保險 (Private insurance)如 PPO, fee-for-service..04
其他，_____.....05
沒有健康醫療保險 (跳到第四部份).....06

11.2 您需要自己掏腰包去給付做癌症檢查的費用嗎 (不包括每次看診時支付$10 到 25 美元自付額)？

	是	否
11.2.1 乳房攝影檢查	01	02
11.2.2 子宮頸抹片檢查	01	02
11.2.3 糞便潛血檢查	01	02
11.2.4 軟式乙狀結腸鏡檢查	01	02
11.2.5 大腸鏡檢查	01	02

第四部份 健康狀態

下面的問題是關於您對自己健康的看法。這些資訊將會幫助您記錄您的感受和您從事平常活動的能力。

1. **整體來說，您認為自己在過去一年內的健康狀況如何？[請在最能描述您的答案的方格內填上 X 號。]**

極好	很好	好	一般	不好	很不好
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

2. **在過去一年內，身體健康問題限制您平常體力活動的程度如何？**

完全沒有	很少	有-些	相當多	無法從事體力活動
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

3. **在過去一年內，您因為身體健康問題，不論是在家及出外，您從事您的日常工作有多少困難？**

完全沒有	少許	有一些	相當多	無法從事日常工作
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

4. **在過去一年內，您身體疼痛的程度？**

完全沒有	很輕微	輕微	中度	嚴重	很嚴重
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

5. 在過去一年內，您有多少精力?

很充沛	相當多	有一些	少許	完全沒有
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

6. 在過去一年內，您的身體健康或情緒問題限制您與家人或朋友的平常社交活動的程度?

完全沒有	很少	有一些	相當多	無法從事社交活動
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

7. 在過去一年內，您被情緒問題（例如，感覺焦慮、沮喪或煩躁）困擾的程度?

完全沒有	輕微	中度	相當多	極度
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

8. 在過去一年內，您因個人或情緒問題讓您無法從事您的平常工作，學校或其他日常活動的程度?

完全沒有	很少	有一些	相當多	無法從事日常活動
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

第五部份 健康需求調查

1. 假如有一系列用中文介紹關於健康方面的講座，像是防癌方面的主題，您會參加嗎？

會 ..... 01(跳到 1.2)

不會 ..... 02 (跳到 1.1)

1.1 假如不會，請問您不參加的原因是？ [請選擇所有可能的原因]

沒時間 01
沒興趣 02
沒有交通工具 或 沒有人帶您去 03
沒人看顧小孩 04
必須工作 05
身體很健康 06
其他 _____ 07

〔跳到第 2 題〕

1.2. 這些講座在什麼地方舉辦，對您參加比較方便？ [請勾選所有適當的地方]

華人的社區活動中心 (例如: 美京華人活動中心或其他華人社團)... 01
社區活動中心 (Community Center) 02
老人活動中心 (Senior Center) 03
教堂 04
老人公寓(例如:華樂大廈或凱仁社) 05
中文學校 06
其他 _____ 07

2. 您家中有錄影帶的放映機 (VCR) 或播放影碟的放映機 (DVD player)嗎？

有錄影帶的錄影機 (VCR)..... 01
有影碟的放映機 (DVD)..... 02
有錄影帶的錄影機 (VCR)及影碟的放映機 (DVD)..... 03
都沒有 04

3. 假如我們提供您與健康有關的中文錄影帶或影碟，您會看嗎？

會 01

不會 02

3.1 如果不會，請問您的原因是？[請選擇所有可能的原因]

沒時間 01
沒興趣 02
沒有錄影機 03
必須工作 04
身體很健康 05
其他 _____ 06

4. 在錄影帶或影碟中，您覺得什麼形式的劇情最有效的介紹防治癌症的重要性和方法？[請勾選所有您推薦的方式]

健康教育專家或醫護專業人員的講解 01
以真實故事的形式 02
訪問癌症病患或家屬 03
小組討論的形式 04
邀請名人主持討論和介紹故事 05
其他 _____ 06

5. 如果送您一張電腦光碟片，內容是和健康有關的故事和資訊。您會使用家中、工作、或圖書館的電腦來閱讀它嗎？

會 01

不會 ..... 02 [跳到 5.1]

5.1 如果不會，請問您的原因是？[請選擇所有可能的原因]

不會使用電腦 01
家中沒有電腦 02
工作地方不方便看 03

不喜歡使用電腦 04
不會去圖書館使用電腦 05
沒時間 06
沒興趣 07
其他 _____ 08

6. 您的電腦有網路嗎?

有 ..... 01 [跳到 6.1]
沒有 [停住] 02

6.1 您會上網去閱讀與健康有關的資訊嗎?

會 [停住，跳到結語] 01
不會 ..... 02 [跳到 6.2]

6.2 如果不會，請問您的原因是？[請選擇所有可能的原因]

不會使用電腦 01
家中沒有電腦 02
不喜歡閱讀網路上的資料 03
沒時間 04
沒興趣 05
其他 _____ 06

[結語]

非常感謝您花時間完成我們的訪談。您已經幫助了我們去幫助其他的婦女們，就像我們幫助您一樣。我
們會在一年左右再打電話給您，看看您是不是一切都很順利。很高興能夠和您談話。假如您對這項研究有任何問題，請向喬治城大學陳美玉女士聯絡，她的電話是 (202) 687-0155。

謝謝。再見。

Appendix B

Manuscript:
"Cultural Views, Language Ability and Regular Mammography Use in Chinese American Women"

Cultural Views, Language Ability and Regular Mammography Use in Chinese American Women

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INTRODUCTION

Asian Americans and Pacific Islanders (AAPIs) are one of the fastest growing and most culturally diverse minority groups in the U.S., and Chinese are the largest AAPI ethnic group (23.8%). However, AAPIs remain one of the most poorly understood minorities as a paucity of research has explained their cancer outcomes. While the use of mammography and Pap smears has increased over the past decade (Breen and Kessler, 1994), screening rates among AAPIs remain the lowest among all U.S. ethnic groups (CHIS). Chinese American women even had lower mammography use rate than their Asian counterparts, such as Japanese, Korean, Filipino, and Vietnamese (Tu, 1999, CHIS). Although use of mammography and Pap smears in Chinese American women aged 50 and older have been increased (Lee, 1996), few women had recent screening and even fewer received regular screening (Lee, 1996). Given the fact that most of older Chinese women are immigrants, Chinese women may face unique cultural and language barriers to utilizing health services like screening mammography, on top of any other known screening barriers such as health insurance, physician communication, and attitudes toward screening (Tang et al, 2000, Yu et al, 2001,Tu et al, 2003, Wang et al 2006).

Previous studies have noted that cultural values affect cancer communication and screening in Asian minorities. For example, Cambodian American women who believed in karma were less likely to have ever had a Pap smear than those who did not (Taylor, 1999). Filipino- and Korean-American women were less likely to receive a mammogram if they went to traditional healers and felt embarrassed talking about breast cancer or mammography (Maxwell, 1998a). Older Chinese women holding an eastern cultural view were less likely to adhere to colorectal cancer screening (Wang, 2006). Qualitative research has suggested that these values keep Chinese individuals from seeking Western medical care and create misconceptions of

illness and cancer (Ma, 1999; Yamashiro and Matsuoka, 1997; Hoeman, 1996; Vu, 1996; Mo, 1992). For instance, illness is a result of fate and cancer is a dormant disease that can be triggered by breathing polluted air or eating frozen, preserved, or raw food.

Chen (1996) proposed a theory about perceptions of disease prevention and health promotion among older Chinese Americans. It concluded that Chinese people tend to view health holistically, where the ultimate goal is to harmonize with nature. They "harmonize with the environment" by adjusting and balancing the "yin-yang" in food intake and exercising regularly outdoors. They "follow the bliss" to react to whatever happen in their lives, which means they passively but positively deal with their destiny. In addition, they "listen to heaven" to accept that life events are already destined to happen and bad things or illness are a form of punishment. Similary, Liang (2004) found that older Chinese women emphasized self-care by keeping moderate exercise and eating a hot-cold balanced diet, and some held a fatalistic view of illness and cancer. These cultural beliefs and values are especially ingrained in older Chinese Americans (Mo, 1992).

For immigrants from non-English-speaking countries, language use is a key component of acculturation (O'Malley et al, 1999; Acevedo, 2000; Anderson et al, 1993). Previous studies have found that acculturation, as measured by language use, is associated with use of medical care (Chesney et al, 1982; Van der Stuyft et al, 1989; Wells et al, 1989), drinking and smoking patterns (Chen et al, 1999; Coonrod et al, 1999; Alaniz et al, 1999; Chen et al, 1999), and compliance with therapy (Pachter and Weller, 1993). Acculturation is also predictive of practice of breast self-examination (Peragallo et al, 2000), and receipt of a mammogram (O'Malley, 1999; Suarez and Pulley, 1995) and a Pap smear (Suarez, 1995; Solis et al, 1990). A few studies indicate that the ability to speak English and the degree of English fluency were significantly

related to recent mammography and Pap test use among Chinese women (Yu et al., 1998, Lee, 1996, Tu, 2003).

The literature has suggested that cultural views and language ability effect Chinese women's participation in cancer screening. However, scarce research has examined whether these dynamic cultural factors independently explain cancer screening outcomes when including other important covariates (i.e. use of medical care). The goal of this study was to expand the knowledge of cultural and acculturative impact on Chinese women's receipt of mammography by using comprehensive cultural measures and evaluating their associations after controlling for use of medical care, access factors, and psychosocial factors including cancer worry and perceived susceptibility. We hypothesized that Chinese women with a strong Chinese view of health and medicine or limited English ability were less likely to have regularly received mammography than those with a less Chinese cultural view of health or better English ability.

METHODS

This cross-sectional study was part of a larger randomized controlled trial to improve cancer screening use in Chinese American women. The study protocol was approved by the Institutional Review Board at Georgetown University. Data on cultural views and cancer screening were collected through telephone interviews of Chinese American women recruited from local Chinese communities.

Population, Setting, and Eligibility

The study population was Chinese American women residing in the metropolitan Washington D.C. area. Eligibility criteria included being 50 and older and ability to communicate in Mandarin, Cantonese, Taiwanese, or English. Women who were short-term visitors (i.e. those who planned to stay in the U.S. for less than a year) were excluded because a

long-term follow-up is planned to assess use of cancer screening at 15 months following educational interventions and visitors usually do not receive preventive health care in the U.S.

Recruitment and Data Collection

A convenience sample of participants was recruited from several community-based venues, including Chinese churches, senior centers, health fairs, celebration banquets of Chinese organizations, and Chinese print media. Typically, leaders of the organizations endorsed the project and introduced the research team to the congregation or group. The research team then presented a brief overview of the project, including timeline of assessments, receipt of cancer educational materials, and risks and benefits of participation. Women were encouraged to participate because their views about health and cancer and experiences in preventive care would help understand the needs for cancer control in Chinese American women. Interested women were asked to provide a written consent and leave their contact information. Other strategies supplementing the group recruitment method included announcements in church bulletins, invitational flyers or announcements distributed to community organization members, and advertisements posted in local Chinese newspapers and grocery stores. Those women who contacted the research team and expressed their interest in participating in this study were required to mail back a signed consent form. Women providing the written consent received a bottle of brand-name multi-vitamin supplement either on site or by mail as a token of appreciation for participation. Consenting women were then contacted for a 30-minute computer-assisted telephone interview (CATI) by trained Chinese American interviewers. Interviewers received a one-day training first to get familiar with the survey and CATI system, and their initial interviews were supervised by investigators until they could fluently perform the tasks and handle participants' questions well. Eight people conducted the interviews, including

four Mandarin-speaking graduate students, one research assistant fluent in Mandarin and Taiwanese, and three Cantonese-speaking independent contractors. All, except for one student, were females. The majority of the interviews were conducted in Mandarin. Women who did not speak Mandarin were interviewed in their preferred dialects, such as Cantonese and Taiwanese.

Measures

Outcome variables

Utilization of mammography was our primary outcome. Women's history of participation in screening mammography was measured by questions regarding whether they ever had each kind of screening test, the date of the most recent test, and the interval between the two most recent tests (Rakowski, 1993). The stages of screening mammography were categorized as regular or non-regular. Regular screeners included women who had a mammogram in the past year and had a previous mammogram within two years prior to the most recent test. Women who had mammograms beyond this time frame or who never had the tests were considered non-regular screeners. Women were also asked about whether they underwent each screening test for health reasons (i.e., due to symptoms) or for routine checkups. Women who had undergone the tests for diagnostic reasons were excluded from subsequent analyses.

Predictor variables

Cultural views of health and illness. Chinese cultural views were assessed by 30 items. These items were primarily derived from qualitative data of five focus groups consisting of 54 older Chinese American women who were asked about their views of health, illness, cancer, and cancer screening (Liang, 2004). In addition, Chen's theory of Chinese American elders' view of health and illness (1996) and existing measures, such as beliefs in the balance of "yin and yang" and fatalism (Lee, 1996; Lannin, 1998) were incorporated. Responses to each item were assessed

on a 5-point Likert scale, ranging from "strongly agree," "agree," "neutral," "disagree," to "strongly disagree." The overall 30-item sum score was standardized to a scale of 0 to 100, in which a higher value represented a more Chinese cultural view. Principal component factor analysis of these 30 items yielded 7 factors, namely, fatalism, self-care, hot-cold balance, use of herbs, Western medicine, medical checkup, and lifestyle (Table 1, Liang, unpublished data). Since the 9-item fatalism and 2-item self-care sub-scales were consistently and significantly associated with breast, cervical, and colorectal cancer screening, their associations with mammography use in the presence of other important controlling variables were also examined. The reliability of the 30-item, fatalism, and self-care scales were 0.80, 0.82, and 0.73, respectively.

Language ability. Women's English ability was assessed by four items asking about their ability to read, write, listen to, and speak in English (Anderson, 1993), with a 5-point Likert type response ranging from "not at all," "not good," "fair," "good," to "very good." The sum score of these four items were re-categorized to four categories based on distribution, with a higher value representing higher English ability.

Controlling variables

Worry. Worry about developing breast cancer was assessed by one question: "Overall, how worried are you that you might get breast cancer someday (1 = not worried, 2 = somewhat, 3 = worried, and 4 = very worried)?" (Schwartz, 1995) Based on the distribution of responses, this variable was re-categorized to "not worried at all" vs. "worried."

Perceived susceptibility. This was assessed by one question: "During last year, how often have you thought about your own chances of getting colorectal cancer (1 = not at all or rarely, 2 = sometimes, 3 = often, and 4 = a lot)?" (Schwartz, 1995) Based on the distribution of

responses, this variable was dichotomized into "not or rarely thinking about getting breast cancer" and "thinking about it (sometimes, often, or a lot)".

Health insurance. This was assessed by one question: "Do you have any health insurance coverage (Yes vs. no)?"

Perceived access barriers. Women were asked whether there were concerns about transportation, time arrangement, language, and health care coverage when making decisions whether to seek health care. This access barrier variable was then categorized as "no" and "yes (having at least one of the concerns)."

Physician recommendation. This variable was assessed by one question: "In the past two years, did any doctor who you had visited recommend you to have breast cancer screening (Yes vs. no)?"

Family/friend encouragement. Women were asked whether their family, relatives, or friends ever encouraged them to get mammography (Yes vs. no).

Sociodemographics.

We assessed age (50 to 64 vs. 65 and older), educational level (up to high school vs. college or higher), employment status (yes vs. no), and annual income. Annual income was subsequently excluded from the analysis because the variable had greater than 30% missing values.

Analysis

Descriptive analyses were performed first using t-tests or chi-square tests to compare differences between women who had regular mammography and those having not in terms of sociodemographics, cultural views, language ability, and other controlling variables. Next, a series of logistic regression analyses were conducted to examine associations between cultural

views, language ability, and mammography use: First, the base model consisted of sociodemographic variables (Model I); in Model II, controlling variables were included; next, cultural views and language ability variables were added to the second models. As mentioned before, we used both the overall 30-item cultural scale (model III) and the fatalism and self-care subscales (Model IV) to test the effect of cultural views on mammography use.

RESULTS

Of the 626 women who expressed initial interest in participation, 558 (89.1 %) completed a written consent. Of the 558 consenting women, 51 (9%) did not complete the telephone interview because of lack of interest when contacted again (N=17), ineligibility (N=9), or they stated they were too busy for the interview (N=7), felt uncomfortable talking about cancer (N=11), or could not be contacted for an interview (N=7). Overall, 507 Chinese women constituted the final study sample. About 21% of participants were recruited from Chinese churches, 17 % from senior centers or senior assisted living buildings, 29 % from other Chinese community organizations (e.g., alumni associations, community service organizations, and book and dance clubs), 14 % from health fairs, and 19 % from media or referrals from friends who either participated in or supported this study. Thirty-nine interviews (7.7 %) were administered face-to-face in senior centers (n=29), church (n=2), Chinese schools (n=2) or participants' homes (n=3) because of difficulty in completing the interview over the phone or in reaching the participants by telephone. In addition, three participants completed the baseline survey and returned them by mail because they were too busy to set aside time for a telephone interview. A few interviews were conducted in languages other than Mandarin: Twenty-five were conducted in Cantonese, five in Taiwanese, and four in Fuzhou, and three in English.

After excluding women who had mammography due to breast health problems, a total of 466 (91.9% of 507) women constituted the final sample. All participants were foreign born except for three who were born in the U.S. and raised up in a Chinese-speaking environment. About 64% were born in China, 3% in Hong Kong, 29% in Taiwan, and 4% in other countries including Singapore and Vietnam. The mean age of the sample was 64.5 years (standard deviation, SD = 9 years; range: 50 to 89 years). The majority of participating women had a college degree or higher (68%), had health insurance (77%), and was married (73%). Thirty-seven percent were employed. About 53% of the participants regularly obtained mammograms.

Table 2 describes the differences between women having and not having regular mammography. Women who reported to have had regular mammography were significantly more likely to be younger, highly educated, and employed than those not having regular mammograms. Compared to those not having regular mammograms, women who had regular mammograms were also more likely to worry about getting breast cancer, perceive a higher risk of getting breast cancer, have health insurance, receive physician recommendation, and have higher English ability. They were less likely to perceive access barriers, receive encouragements from family and friends for mammography, and hold Chinese cultural views of health and illness.

Model I shows that, after controlling for other sociodemographics, the effect of age on mammography use became insignificant (Table 3). In Model II, education and employment status were still significantly associated with mammography use. All the controlling variables, except for perceived risk for breast cancer and perceived access barriers, remained significant associations with mammography use. After cultural views and language ability were included in the model, higher education and being employed no longer predicted regular mammography use.

On the other hand, cultural views and English ability significantly predicted Chinese women's regular use of mammography. With each increase of the English ability scale, there is a 40% increase in regular use of mammography. Similarly, with one point increase of the overall cultural sum score (a more Chinese cultural view), there is a 4% decreased likelihood for a Chinese women to have regular mammography. The effects of fatalism and self-care sub-scales on regular mammography use were both significant (OR=0.98, 95% C.I.=0.97~0.99), and OR=0.99, 95% C.I.=0.98~0.99, respectively), after controlling for sociodemographics and other important factors to cancer screening practice.

DISCUSSIONS

This is one of the first studies examined the associations between cultural views, language ability, and regular mammography use in Chinese American women using comprehensive measures and controlling for other important factors related to mammography use. Our results demonstrate that, in addition to known factors contributing to women's mammography screening behavior such as physician recommendation and health insurance, cultural views and language ability are important barriers for older Chinese American women to obtain regular mammograms.

As hypothesized, women who held a more Chinese/Eastern cultural view were less likely to adhere to mammography screening guidelines. Although having health insurance and physician recommendation are the two prominent predictors of regular mammography in our sample, the linear association between cultural views and mammography adherence cannot be overlooked. The predictive power of cultural views on mammography use is robust, remaining significant by using either the overall cultural scale or the fatalism and self-care sub-scales. These suggest that the degree of inclination to Chinese cultural views influences a Chinese

woman's mammography screening behavior, and a change in any aspects of the cultural view is likely to modify Chinese women's mammography behavior.

Our finding of the negative association between English ability and regular mammography use is similar to findings from the literature showing that language ability is associated with initiation of health services or screening (Yu et al., 1998, Lee, 1996, Tu, 2003). This association persists after controlling for physician recommendation and other known factors to mammography use. One possible explanation is that women who had no or limited English ability were not able to fully communicate with their physicians and understand the needs for regular screening, even though mammography was recommended by their physicians. Another reason may be that women with low English ability were not likely to obtain health-related information in their native language as frequent as those written in English, which is evidenced by our previous study that Chinese women identified very limited resources of Chinese language health educational information from local Chinese newspapers and television channels or displayed in hospitals or clinics (Liang, 2004).

The associations between education and employment and mammography use were cancelled out when cultural views and language ability were included in the model. In other words, the influence of education and employment on mammography use is mediated by cultural views and language ability. Chinese women who had a higher educational level or were employed were more likely to adhere to mammography screening, compared to those with a lower educational level or not employed, because they were likely to better communicate with health care professionals in English or readily obtain health related information in English. Similarly, they were less likely to hold certain cultural views that kept them from seeking regular mammography. These findings suggest that addressing cultural and language barriers to

mammography screening experienced by Chinese women, especially those with a lower socioeconomic status, is a promising strategy to reduce screening disparities between women in lower and higher socioeconomic status.

Several limitations of this study should be considered when interpreting the results. First, the 30-item cultural view scales were developed primarily from responses of Chinese American women aged 50 and older to questions regarding their perceptions about health and illness/cancer and their experiences in health care in the U.S. (Liang, 2004). It is possible that other aspects of cultural views held by Chinese Americans were not captured. Second, the generalizability of this study is limited by the use of a convenience sample drawn mainly from Chinese community organizations, churches, and senior centers. Although mass media were used to encourage participation, relatively small numbers of women participated through this channel. Therefore, women who did not attend any activities or programs held by Chinese organizations, such as restaurant workers or those speaking in other Chinese dialects, are likely to be underrepresented in our sample. Cultural patterns as well as their associations with cancer screening behaviors may be different if these people are included. In addition, measures of cancer screening behaviors are subject to self-report bias.

Despite of the limitations, this study shows that different aspects of cultural views and English ability have great potentials in influencing older Chinese American women's mammography screening behavior. These two aspects are relatively modifiable, compared to other known factors such as health insurance coverage and other access barriers. Cancer screening educational programs targeting Chinese women are likely to be successful if acknowledging women's cultural barriers and including messages that counter those cultural barriers. For instance, women with a sense of fatalism need to be empowered to take charge of

their breast and cervical health. Likewise, health care providers should be sensitive to possible cultural barriers of their Chinese patients, especially those who are older immigrants, and address their specific concerns that keep them from getting mammograms. With respect to the language barrier, Chinese language educational materials, such as brochures, videos, booklets, and displays need to be readily available in clinics, hospitals, libraries, and mass media to provide older Chinese women with limited English ability with accessible information. Future research is needed to examine whether addressing cultural barriers through language-appropriate education and/or counseling and developing and distributing Chinese language educational materials will improve Chinese women's cancer screening adherence in a large representative sample.

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Table 1 Description of the 30-item cultural view scale.

Category	Statement
Fatalism	
	If I am meant to get cancer, I will get it.
	If we get cancer, the best way to deal with it is to accept it, just like the old saying: "Listen to heaven and follow fate."
	Health or illness is a matter of fate. Some people are always healthy; others get sick very often.
	I cannot control my destiny.
	Avoiding cancer is a matter of personal luck.
	No matter what I do, if I am going to get cancer, I will get it.
	It is hard to prevent cancer.
	Getting Cancer is like being sentenced to death.
	It is best not to think about cancer. If we think about it too much, we probably will get cancer.
Self-care	
	As long as I can take good care of myself and keep myself healthy, I don't need to see a doctor.
	I don't visit doctors if I'm not feeling sick.
Use of herbs	
	Herbs are a better choice for preventing diseases than western medicine.
	Herbs are more effective in harmonizing a person's yin-yang than western medicine.
	Herbs are better remedy for illness than western medicine.
Lifestyle	
	Regularity in meals and daily schedules can make us healthy.
	Keeping my mind happy, doing my hobbies, and not competing with others can lead to better health.
	Regular outdoor walking is essential to achieve good health.
Medical examination	
	I will be embarrassed if a doctor or a nurse checks my private parts.
	A lot of medical tests are too intrusive and make me uncomfortable.
	Medical doctors usually do unnecessary tests.
Hot-cold balance	
	Certain food is not good for me because it will disturb the hot-cold balance in my body.
	Most diseases, excluding external wounds, are caused by the imbalance between hot and cold in a person's body.
	Eating "cold" food in summer and "hot" food in winter will help strengthen my body.
Western medicine	
	We should not take "western" medicine too often, because its chemical ingredients will hurt our bodies.
	Western medicine is good for killing germs rather than preventing diseases.
Miscellaneous	
	Eating food prepared by myself is a key to good health.
	I know my body better than any one else.
	Bodily constitution is different for every person; therefore, some kinds of people are more likely to get cancer than others do.
	Going to clinics or hospitals too often will cause me to catch diseases or having bad luck.
	Qi-Kung or Tai-Chi practice can help regulate the "chi" in the body, which can increase one' stamina and prevent diseases.

Table 2 Characteristics of participating Chinese American women aged 50 and older by mammography status (N=466).

Characteristics	Not having regular mammography	Having regular mammography	P values
	N= 221 (47.4%)	N= 245 (52.6%)	
Demographics			
Age			
50-64 y/o	45.5%	65.6%	<0.0001
≥ 65 y/o	54.5%	34.4%	
Education			
High school or less	44.9%	16.7%	<0.0001
College or above	55.1%	83.3%	
Employed (% yes)	22.5%	52.5%	<0.0001
Controlling variables			
Cancer worry (% ever)	28.2%	46.6%	<0.0001
Perceived susceptibility			
Low	54.3%	41.6%	0.0009
High	25.3%	41.6%	
Missing	20.4%	16.7%	
Health insurance (% yes)	62.9%	91.9%	< 0.0001
Perceived access barriers (% yes)	64.5%	46.2%	< 0.0001
MD recommendation (% yes)	34.7%	72.0%	< 0.0001
Family/friend encouragement (% yes)	31.0%	21.3%	0.0171
Predictor variables			
Language ability			
Low	40.0%	10.0%	<0.0001
Medium-low	33.5%	22.6%	
Medium-high	14.7%	31.2%	
High	11.8%	36.2%	
Cultural views			
Overall sum score (mean)	57.0	50.9	< 0.0001
Fatalism (mean)	46.6	36.7	< 0.0001
Self-care (mean)	54.0	35.5	< 0.0001

Table 3 Logistic regression models describing associations of cultural views with mammography adherence in Chinese women (N=466).

Variable	Model I Demographics	Model II Model I + controlling variables	Model III Model II + predictor variables	Model IV Model II + predictor variables
Demographics				
Age (≥ 65 y/o vs. 50-64 y/o)	0.91 (0.57~1.43)	0.96 (0.57~1.63)	1.05 (0.61~1.79)	1.06 (0.61~1.82)
Education (College or above vs. High school or less)	2.92 (1.85~4.63)	2.12 (1.27~3.54)	1.14 (0.63~2.07)	1.05 (0.57~1.94)
Employed (Yes vs. No)	2.74 (1.71~4.39)	2.02 (1.17~3.48)	1.67 (0.95~2.95)	1.52 (0.85~2.70)
Controlling variables				
Cancer worry (Ever vs. never)		1.91 (1.18~3.08)	1.98 (1.21~3.22)	1.94 (1.19~3.18)
Perceived susceptibility				
Missing vs. high		0.80 (0.41~1.54)	0.83 (0.42~1.64)	0.83 (0.41~1.67)
Low vs. high		0.72 (0.43~1.20)	0.72 (0.43~1.20)	0.70 (0.42~1.18)
Health insurance (Yes vs. No)		3.82 (2.07~7.08)	3.28 (1.74~6.20)	3.12 (1.65~5.92)
Perceived access barriers (Yes vs. No)		0.75 (0.48~1.18)	0.82 (0.52~1.30)	0.84 (0.53~1.34)
MD recommendation (Yes vs. No)		3.20 (2.05~5.01)	2.92 (1.85~4.61)	2.80 (1.76~4.46)
Family/friend encouragement (Yes vs. No)		0.46 (0.28~0.76)	0.50 (0.30~0.84)	0.51 (0.30~0.86)
Predictor variables				
Language ability			1.43 (1.10~1.86)	1.44 (1.11~1.89)
Cultural views				
Overall sum score			0.96 (0.94~0.99)	
Fatalism				0.98 (0.97~0.99)
Self-care				0.99 (0.98~0.99)
C-statistic	0.706	0.816	0.827	0.834

Note. Language and cultural views are continuous scores. High language scores mean higher English ability. High scores on cultural views indicate a more eastern view of care; low scores reflect a more western view of care. For every 1 point increase in the cultural scale, the odds of being regular screeners were 4% less than being non-regular screeners.

Appendix C

Abstract

2005 Era of Hope Meeting

and

American Society of Preventive Oncology Meeting

TITLE: IMPACT OF CULTURE ON BREAST CANCER SCREENING IN CHINESE AMERICAN WOMEN

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Introduction: Breast caner is the second leading cause of cancer death in Chinese American women, the largest Asian population in the U.S. Despite improving rates of mammography use, Chinese women still have much lower rate of mammography screening and experience poorer survival than Whites. Unique cultural health beliefs and attitudes towards cancer and western medical care may relate to screening behavior in Chinese women. The goal of this study is to examine associations between cultural views of healthcare and mammography screening behavior after controlling for covariates.

Methods: A community-based sample of 462 Chinese women aged 50 and older completed baseline interview via telephone. These women were recruited from Chinese community events, senior center, churches in Washington DC area. We measured cultural views by a 30-item cultural scale including aspects of fatalism, use of herbs, self care, hot-cold balance, and attitudes toward western medicine and examination. Validated scales were used to measure demographics, medical resources, English ability, and breast cancer worry. The outcome variable is whether or not women regularly obtain a mammography screening. Regular screeners were defined as women having two consecutive mammograms in age-appropriate interval (every 1-2 years). Women never having a mammogram and ever having had mammograms, but outside of the age-appropriate interval, were considered as non-regular screeners. Logistic regression was used to examine the associations between predictors and the outcome. Significant bivariate associations were controlled for in the logistic regression models.

Results: Forty-eight percent of 462 women obtain regular mammography screening and 52% were non-regular screeners. Compared to non-regular screeners, women who regularly participate in mammography screening were less likely to hold an Eastern view of care (OR 0.96 95%CI 0.94 - 0.99), controlling for covariates. In other words, for every 1 point increase in the cultural scale (0-100 points; high scores indicates more Eastern view), women were 4% less likely to be a regular mammography screener. Women with higher English language ability were significantly more likely to be regular screeners (vs. non-regular) than women with lower ability (OR 1.81 95%CI 1.06 - 3.10). Women who more worried about getting breast cancer were more likely to obtain regular screening (vs. non- regular) than women who less worried (OR 2.71 95%CI 1.52 - 4.82). Physician recommendation and health insurance also play a key role in women's regular screening behavior.

Conclusion: Our baseline results suggest that cultural, lanaguage, and attitudinal factors affect regular mammography screening behavior in Chinese American women. Culturally sensitive and linguistically appropriate interventions designed to overcome

Chinese women's barriers are needed to enhance their participation in regular breast cancer screening.

The U.S. Army Medical Research and Materiel Command under DAMD17-02-1-0390, the NCI, and the Susan G. Komen Breast Cancer Foundation supported this work.

Physician and Patient Characteristics and Cancer Screening Recommendation for Older Chinese-American Women

Liang W, Wang JH, Chen MY, Mandelblatt JS

PURPOSE: To investigate factors associated with physician recommendations of breast, cervical, and colorectal cancer screening for older Chinese-American women

METHODS: 438 Chinese-American women aged 50 and older completed telephone interview on health care and cancer screening experiences. Predictor variables include age and educational level, physician gender and specialty, length of physician-patient relationship, and language used during medical visits. Outcome variables were physician recommendations for breast, cervical, and colorectal cancer screening in the past two years. Logistic regressions were used to evaluate associations between predictors and outcomes.

RESULTS: Older age (65+ vs. 50-64) was associated with less physician recommendations for all cancer screening (OR: 0.34~0.51). Chinese women were more likely to have received breast and cervical cancer screening recommendations if their regular doctors were family/general physicians (vs. other specialists; OR=2.17 and 1.82, respectively) or they had seen their doctors for more than 3 years (OR=1.87 and 2.17, respectively). Women communicating with their doctors in English (vs. Chinese) were more likely to receive breast and colorectal cancer screening recommendations (OR=1.96 and 2.04, respectively).

CONCLUSIONS: Physicians do not consistently recommend cancer screening to Chinese-American women. Efforts are needed to encourage physicians to discuss screening guidelines to their elder, newer, and English non-proficient patients.

Appendix D

Manuscript:
"The Influence of Culture and Cancer Worry on Colon Cancer Screening Among Older Chinese-American Women"

The Influence of Culture and Cancer Worry on Colon Cancer Screening Among Older Chinese-American Women

J. H. Wang, PhD; W. Liang, DDS, PhD; M. Y. Chen, MS; J. Cullen, MPH, PhD; S. Feng, PhD; B. Yi, MS; M. D. Schwartz, PhD; J. S. Mandelblatt, MD, MPH

Objectives: This study investigated the hypothesis that adherence to colon cancer screening guidelines among Chinese women was associated with Eastern cultural views and anxiety about developing colon cancer.

Design: Cross-sectional data from a community-based longitudinal study were used to examine the hypothesis of this study. Measures of sociodemographics, medical access factors, cultural views of health care, cancer worry, and practices of colon cancer screening were administered by a computer assisted telephone interview.

Participants: Four hundred and thirty-three Chinese-American women from Metropolitan Washington, DC age 50 years and older and without a history of colon cancer completed the telephone interview.

Main Outcome Measure: Adherence to utilization of either fecal occult blood test (FOBT) within a year, sigmoidoscopy within five years, or colonoscopy within 10 years was used to define two outcome categories: current screeners and noncurrent screeners.

Results: Controlling for covariates, this study found that: 1) women with more Eastern cultural views were less likely to be current screeners; 2) women who thought about the chance of getting colon cancer had approximately three-fold greater odds of being current screeners than women who never thought about colon cancer; and 3) women receiving physician recommendation for colon cancer screening had more than three-fold increased odds of being current screeners than those who had not received a recommendation.

Conclusions: In addition to the lack of physician recommendation, older Chinese women face cultural and psychological barriers to obtaining timely colon cancer screening. These barriers may be reduced through culturally sensitive intervention studies. (*Ethn Dis.* 2006;16:xxx-yyy)

Key Words: Cancer Worry, Chinese-American Women, Colon Cancer Screening, Colonoscopy, Cultural Views of Health Care, FOBT, Physician Recommendation, Sigmoidoscopy

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<h1>Introduction

Colon cancer is the second most common cancer and the third leading cause of cancer-related death among the Chinese-American population. Chinese Americans have higher colon cancer death rates than non-Hispanic Whites[1] and are more likely to be diagnosed with late-stage colon cancer than Japanese and White women.[2] Despite this disease burden, little research has been done on Chinese-Americans' colon cancer screening practices.

In 2001, overall US self-reported colon cancer screening rates (including use of fecal occult blood test [FOBT], sigmoidoscopy, or colonoscopy) were 45%–48%.[3] In contrast, only 22%-31% of Chinese women report ever having had FOBT and sigmoidoscopy, and among these women who ever had FOBT, just 38%-42% report an FOBT in the past year.[4-5] These data are consistent with previous data that indicate that Chinese women also underutilize breast and cervical cancer screening.[6-9]

Lower rates of cancer screening in Chinese women may be the result of several unique cultural and psychosocial barriers, beyond commonly recognized barriers such as lack of healthcare resources and physician recommendation.[4,8-16] For example, traditional Chinese medicine emphasizes natural approaches to treatdisease (eg, herbal medicines and balanced food).[17-19] Furthermore, in Chinese and other Asian cultures, cancer is viewed as an unpreventable and fatal disease.[10,20] Many older Chinese women believe that thoughts about cancer may eventually cause cancer.[19,21] Additionally, Chinese women generally perceive themselves to be at lower risk of developing cancers compared to Caucasian women.[12,19] Given such beliefs, we believe that Chinese-American women who hold Eastern cultural views may be disinclined to obtain colon cancer screening.

This community-based study was designed to evaluate cross-sectional associations between Chinese-American women's cultural views of care, level of worry about the risk of cancer (cancer worry), and use of colon cancer screening tests. We hypothesized that women with more Western cultural views would be more likely to report adherence to colon cancer screening than women with more Eastern views after considering other factors. In addition, based on reports that correlate cancer worry with likelihood of breast cancer screening,[22-24] we hypothesized that colon cancer worry would be associated with screening adherence.

<h1>Methods

<h2>Setting and Recruitment

This report is part of a larger study approved by the Georgetown University Institutional Review Board to investigate the effect of cultural beliefs on cancer screening in Chinese-American women. Chinese women were recruited from the Washington, DC metropolitan area (the District of Columbia, Fairfax County in Virginia, and Montgomery and Prince George's Counties in Maryland).

With support from local Chinese community leaders, the researchers attended health fairs, Chinese New Year Celebrations, and various community events at Chinese cultural service centers, senior centers, churches, and Chinese and Taiwanese associations to introduce this study and to distribute Chinese-language recruitment flyers. Recruitment notices were also posted in Chinese newspapers and Chinese associations' newsletters and web sites. After these public announcements, women were approached to evaluate eligibility and interest in participation. Women who were not US residents and/or were younger than 50 years of age (exclusion criterion from parent study) were excluded from the project. Eligible women were invited to

participate and again were told about the purpose, procedures, benefits, and risks of participating in the study. Participants were offered incentives such as a bottle of multivitamin supplement after enrolling and periodic health-related newsletters after completing the interviews.

Overall, 573 eligible Chinese women expressed interest in participation. Of these, 509 (89%) consented to participate. Of the 509 consenting women, 438 (86%) completed the interview, 6% declined the interview, and 8% were pending contact at the time of the present analyses. Of the 438 women who completed the interview, five reported a personal history of colon cancer and were eliminated from analyses. Thus, the final sample for this report was 433 women.

<h2>Data Collection

A structured telephone interview was used to collect information regarding practices of FOBT, sigmoidoscopy, and colonoscopy; cultural views about health care and Western medicine; presence of physician recommendation; worry about getting colon cancer; and sociodemographics. All survey questions were translated into written languages commonly used in China, Hong Kong, and Taiwan. Bilingual speakers (English and Chinese) translated the survey questions, and back-translation was conducted to assure accuracy. Trained interviewers speaking Mandarin, Taiwanese, or Cantonese conducted computer-assisted telephone interviews with consenting women. Three participants chose to complete the interview in English. Eighteen participants who had difficulty in answering questions by telephone were interviewed in person. On average, the interviews lasted one hour.

<h2>Measures

<h3>Outcome Variable

Utilization of colon cancer screening was our primary outcome. According to clinical guidelines endorsed by the American Cancer Society, asymptomatic and average-risk adults aged 50 and older should receive either an annual FOBT, a sigmoidoscopy every five years, or a colonoscopy every 10 years.[25] We measured Chinese women's adherence to these guidelines with a series of questions. First, participants responded to separate questions about whether they had ever had FOBT, sigmoidoscopy, or colonoscopy. Women who reported having ever had a particular test were queried about when they had their most recent test. For FOBT, choices of screening intervals ranged from within one year, one to two years, more than two years. The intervals for sigmoidoscopy were from within one year, less than or about five years, and beyond five years. The timing of the most recent colonoscopy was either within or more than 10 years. Alternatively, women could respond to the choice--don't know or unsure--if they did not remember when they went for the test.

Based on answers to these questions, colon cancer screening outcomes were divided into two levels: current and noncurrent. Current screeners were defined as having either FOBT within a year, sigmoidoscopy within five years, or colonoscopy within 10 years. Noncurrent screeners were women who either had not had any of the three tests within the recommended screening interval or had never been screened for colon cancer.

<h3>Predictor Variables

<h4>Cultural Views of Health Care

Based on previous focus group data from Chinese-American women,[21] we developed a scale to measure Chinese women's cultural views about cancer and health care. The scale

consisted of 30 items designed to measure the use of herbs, values of Western medicine, fatalistic views of cancer, lifestyles, modesty, feelings about Western medical examinations, other cultural ways of care (eg, practices of Qi-kung or Tai-Chi), and traditional beliefs in hot-cold. For each item, women responded by using a five-point Likert scale from strongly agree to strongly disagree. The inter-item reliability was .80.

<h4>Cancer Worry

We assessed cancer worry with two items from previous research.[26] Explicit worry was measured with the item: "Overall, how worried are you that you might get colon cancer someday? 1= not worried, 2= somewhat, 3= worried, and 4= very worried. Thoughts about cancer were assessed by the item: "During last year, how often have you thought about your own chances of getting colon cancer? 1= not at all or rarely, 2= sometimes, 3= often, and 4= a lot."

Based on the distribution of responses, each of these variables was dichotomized: not worried vs any worry (somewhat, worried, and very worried), and not thinking about getting colon cancer vs thinking about it (sometimes, often, and a lot). "Worry" and "thoughts" were each analyzed separately to examine their unique effect on screening.

<h3>Covariates

<h4>Sociodemographics

We assessed age (50-64 vs ≥65+), educational level (≤high school vs >high school), marital (currently married vs not married) and employment status (yes vs no), and annual income. Annual income was subsequently excluded from the analysis because the variable had >30% missing values.

<h4>Medical Access Factors

We also assessed medical access factors such as having health insurance (do you have any health insurance coverage? Yes/No), presence of a regular physician (do you have a doctor or nurse you usually see when you are sick or want a checkup? Yes/No), and physician recommendation (in the past two years, did any doctor recommend that you have colon cancer screening? Yes/No).

<h4>Symptoms

We sought to distinguish between colon cancer tests that were for the purpose of screening vs those that were diagnostic; thus, all participants were asked the following question: "Did you go for your last FOBT (or sigmoidoscopy, or colonoscopy) because of health reasons or as part of a routine checkup?" Of the 433 women, about 57% reported that they received screening as part of a routine check-up. These women were classified as asymptomatic; the 19% (n=82) who reported that they underwent one or more of these tests for health reasons were classified as symptomatic. Among women who had never had colon cancer screening (n=106), we asked: "Have you ever heard about these tests?" If the answer was "yes," we asked why they had not received the tests. Those who reported not having had these tests because they were healthy and had no physical symptoms were also classified as asymptomatic (n=55). To be conservative, the remainder of these participants (n=51) were classified as symptomatic. Thus, overall we classified 300 women (69%) as asymptomatic and 133 (31%) as symptomatic.

<h2>Data Analysis

We conducted bivariate and multivariate analyses to test the two study hypotheses. Missing data from the cultural scale were imputed with a mean substitution. Scores on each cultural item were summed to yield an overall Chinese cultural view score. We normalized the cultural sum scores from 0-100 points for the convenience of interpretation. Missing binary variables were imputed by placing missing cases in the category when its odds of predicting a criterion are closer to 1. That is, the missing variable was placed in the category that would decrease the association between the imputed variable and the outcome variable to avoid an artifact of overestimating the association.

To examine bivariate associations between screening and predictors, we used chi-square tests for dichotomous variables and *t* tests for continuous variables. Multivariate modeling of the effects of cultural views and cancer worry on colon cancer screening was conducted by using logistic regression with hierarchical variable entry. Variables with statistically significant associations with screening outcomes were included in the multivariate model. In the logistic models, we employed a hierarchical variable entry approach in which we retained the significant predictors (*P* value <.05) from each tested model and added the next set of predictors to the subsequent models. In model 1, we entered demographic variables including education and employment status. In model 2, we retained significant variables from model 1 and then entered medical access factors (health insurance, presence of a regular doctor, and physician recommendation for colon cancer screening). Model 3 included all significant variables from model 2 plus the symptom variable. Based on its clinical relevance, we controlled for the symptom variable in all models regardless of its significance. In the fourth model, we retained

significant variables and the symptom variable from model 3 and added colon cancer worry and thoughts about colon cancer. To examine whether cultural views about health care explain variance in colon cancer screening outcomes after adjustment for covariates examined in model 4, the variable of culture was the last predictor entered in the final model. Odd ratios (OR) with 95% confidence intervals (CI) were used to estimate the significance of the odds of current screening vs noncurrent screening for each study variable. The assessment of significance of blocks of variables entered in each step was based on estimation of differences in the likelihood ratio chi-square and degree of freedom (*df*) between two evaluated models. The SAS 9.0 version statistical program (SAS Institute Inc., Cary, NC, USA) was used to perform all analyses.

<h1>Results

<h2>Sample Characteristics

Of the 433 participants, 432 were foreign-born. Among the foreign-born women, 60% were born in China, 3% in Hong Kong, 31% in Taiwan, and 6% in other countries including Singapore and Vietnam. The mean age of the sample was 64 years, ranging from 50 to 89 (standard deviation [SD] =9 years). The majority of participants had a college degree or higher (71%), had health insurance (81%), and were married (73%). Thirty-nine percent were employed. Fifty-seven percent (n=246) of the participants were classified as current screeners, and 43% (n=187) were noncurrent screeners.

<h2>Bivariate Analyses

Bivariate associations between sociodemographics, medical access factors, cancer worry, and cultural variables with colon cancer screening behavior are presented in Table 1. Among the

sociodemographic variables, education and employment status were both associated with screening adherence. For medical access factors, current screeners were more likely to have a regular doctor, health insurance, and physician screening recommendation than noncurrent screeners. The presence of symptoms was also associated with being a current screener. Among the psychosocial and cultural variables, current screeners reported higher levels of cancer worry and thoughts about colon cancer. In addition, noncurrent screeners had significantly higher mean scores on Chinese cultural view tests than current screeners, indicating that noncurrent screeners had a significantly more Eastern view of health care.

>>>insert Table 1 here

<h2>Multivariate Analyses

As displayed in Table 2, we tested our hypotheses that culture and cancer worry independently predicted colon cancer screening using logistic regression analysis in which we controlled for other study covariates. Based on bivariate analyses, education and employment status were entered in model 1 as sociodemographic predictors. In this model, education significantly predicted adherence ($P<.0001$), but employment status did not ($P=.31$). In model 2, we retained education and added the medical access factors of health insurance, presence of a regular doctor, and physician recommendation. In model 2, education ($P=.0017$) and physician recommendation ($P<.0001$) were independent predictors of screening. Removing the nonsignificant medical factors of health insurance ($P=.21$) and presence of a regular doctor ($P=.14$) from model 2 resulted in a significant improvement in the model chi-square ($\Delta\chi^2(2)=7.53$, $P<.05$).

>>>insert Table 2 here

In model three, we added our symptom variable to the variables retained from model 2 (education and physician recommendation). Although symptoms were not independently associated with screening adherence (P=.13), we felt that the clinical significance of this variable merited including it in all subsequent models. With symptoms in the model, both education and physician recommendation remained statistically significant. On the next step, we entered psychological factors (worry and thoughts about colon cancer) controlling for study variables retained in model 3. Thoughts about colon cancer exhibited a significant independent effect on colon cancer screening adherence (P=.0081), but worry was not independently associated with screening (P=.1593). Removing worry from the model did not result in a significant change in chi-square ($\Delta\chi^2$ (1)=1.99, P>.05). Thus, worry was excluded in the fourth model.

In the fifth model, we entered the cultural scale score. Culture was marginally predictive of screening adherence (P=.0597) after controlling for prior variables. Notably, upon entry of cultural scale score, education was no longer independently associated with screening outcomes (P=.088), but symptoms became a significant independent predictor (P=.0371). Physician recommendation and thoughts about colon cancer both remained significant predictors of screening adherence.

Given the apparent confounding of the education, symptom and culture variables in the fifth model, we conducted follow-up analyses to explore these associations. We found that culture was highly and negatively correlated with education (r=-0.41, P<.0001), indicating that women who had higher educational level were less likely to hold an Eastern view of care. Given the high overlap between culture and education, we tested a final model identical to the fifth model above, retaining the variable of culture but removing that of education. In this final model, culture significantly (P=.006) and independently predicted colon cancer screening outcomes

(controlling for physician recommendation, symptoms, and thoughts about colon cancer). The model chi-square was not significantly changed when education was removed from the model ($\Delta\chi^2$ (1)=2.9, P>.05). No interaction effect between culture and other independent variables was found.

The results of the final logistic model (Table 2) suggest that women who received a physician recommendation for colon cancer screening had more than three-fold increased odds of being a current screener compared to women who had not received a physician recommendation (OR 3.44; 95% CI 2.25-5.28). Women who sometimes or often thought about the chance of getting colon cancer had about three-fold greater odds of current screening compared to women never thought about colon cancer (OR 2.79; 95% CI 1.63-4.77). Finally, a 10-point increase in Eastern cultural views was associated with a 25% decreased likelihood of being a current screener (OR 0.75; 95% CI 0.740.76).

We further conducted a stratified analysis to examine the degree of confounding between education and cultural views. As shown in Table 3, cultural views were not associated with screening among college-educated participants. However, among participants with less education, noncurrent screeners had a more Eastern cultural view than did those who were current screeners.

>>>insert Table 3 here

<h1>Discussion

We found that the degree of belief in the Eastern way of care was strongly related to a woman's educational level. Chinese women with lower educational levels were significantly more likely to hold an Eastern view of care and were less likely to adhere to colon cancer screening guidelines than Chinese women with postsecondary education. These data suggest that

cultural concepts of health care may be modified by an individual's educational experience. Higher education in modern Chinese society has been greatly influenced by Western science and technology. Chinese-American women with advanced education, especially those who completed their postsecondary education in the United States, are more likely to be influenced by Western culture and have more opportunities to learn about Western medical care. With an understanding of Western preventive care, diagnosis, and treatment, college-educated Chinese women may be more likely to modify their existing Eastern care structure, utilize Western medical services, and follow its preventive guidelines than high school-educated Chinese women.

Although an Eastern view of care was associated with decreased screening adherence, we found that this association was only present among less-educated participants. In post hoc analysis among college-educated women, adherence to screening was significantly related to physician recommendation and colon cancer awareness (data not shown). These results suggest that efforts to target Chinese women for colon cancer screening will need to consider both their cultural perspectives and educational backgrounds.

Similar to research on other minority populations,[27-30] the results of this study suggest that physician recommendation is an independent predictor of colon cancer screening in Chinese women regardless of cultural views of care. Chinese culture regards physicians as authority figures.[31] Chinese women who hold an Eastern view of care and use less Western medical care may be least likely to be exposed to professional recommendation for colon cancer screening. However, our data suggest that when a recommendation is received, it is typically acted upon regardless of whether the individual has an Eastern or Western view of care. Physicians who are enthusiastic about encouraging patients to obtain timely colon cancer screening may explain the benefits of screening to their patients. Chinese women's misconceptions about colon cancer and

screening may be clarified at this time. This encouragement may help Chinese women adapt themselves to Western ways of care by placing more value on Western preventive care, which consequently motivates them to comply with screening guidelines.

We also found that women who worried about developing colon cancer were more likely to obtain timely colon cancer screening than women who were not worried. As has been shown with other ethnic groups,[32-33] apprehension about having colon cancer was significantly associated with Chinese women's colon cancer screening behavior. These data are also consistent with studies examining the role of worry on other forms of cancer screening.[22,24,34] Moreover, thoughts about the chances of getting colon cancer appear to be a stronger predictor in the multivariate analyses than explicit worry. Thoughts about colon cancer may represent awareness of the threat. Thus, patients who are aware of the threat may be more likely to seek screening. Our current cross-sectional data cannot specify the cause and effect between thoughts about colon cancer and screening behavior. However, prior research indicates that emotional factors, such as worry and fear, can facilitate women's behavioral responses to cancer screening and regulate screening behavior in different ethnic groups.[35-36]

Several limitations should be considered in interpreting our results. First, this study was based on a convenience sample of women from the community who volunteered to participate. As a result, the application of these results to the Chinese population may be limited. Individuals who volunteered to participate in this study may have been more interested in learning about colon cancer screening or were more concerned about their health in general. Our sample was not representative in terms of educational level: 71% of our sample reported post-secondary education compared to only 46% of older Chinese women who reported post-secondary education in the 2003 California Health Survey.[6] Second, this sample was virtually all foreign-

born, which limits the study's relevance to other groups of Chinese. Third, results are based on self-report data at one time point. Fourth, our measure of whether a participant was symptomatic or not was imperfect. We attempted to distinguish women who sought true screening from those whose colorectal cancer tests were diagnostic in nature. However, since we based this distinction on a self-report measure, whether the tests reported by these participants were screening or diagnostic tests is unclear. Hence, we chose to include these women in the analyses and control for the variable of symptoms in the multivariate modeling.

Reducing barriers in Chinese women and promoting their use of colon cancer screening may depend on culturally and linguistically appropriate intervention programs. Very few intervention studies have been designed to counteract Chinese women's psychological and cultural barriers. Our results suggest that interventions directed toward increasing colon cancer awareness and knowledge about Western preventive care through physician recommendations are important to enhance Chinese-American women's adherence to colon cancer screening.

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37.

Table 1. Bivariate association between sociodemographics, medical care resources, cancer worry, and cultural variables with screening outcomes (N=433)

Variables	Whole Group No.	Current Screeners (n=246) No.	%	Noncurrent Screeners (n=187) No.	%	P values
Age						.9625
50 to 64 years old	246	140	57	106	57	
≥65	187	106	43	81	43	
Education						<.0001
≤High school	127	51	21	76	41	
>High school	306	195	79	111	59	
Marital status						.1026
Married	316	187	76	129	69	
Divorced/widow/single	117	59	24	58	31	
Employed						.0187
Yes	171	109	44	62	33	
No	262	137	56	125	67	
Presence of a regular doctor						<.0001
Yes	339	210	85	129	69	
No	94	36	15	58	31	
Health insurance						<.0001
Yes	349	215	87	134	72	
No	84	31	13	53	28	
Physician recommendation						<.0001
Yes	193	143	58	50	27	
No	240	103	42	137	73	
Symptoms*						.015
Yes	133	64	26	69	37	
No	300	182	74	118	63	
Worry about getting colon cancer						.0004
Somewhat/often/a lot	166	112	46	54	29	
Not at all	267	134	54	133	71	
Thinks about getting colon cancer						<.0001
Sometimes/often/a lot	97	72	29	25	13	
Not at all	336	174	71	162	87	
Cultural views of healthcare†		M=52.08 (SD 9.46)		M=56.18 (SD 11.06)		<.0001

* Data about symptoms were based on women's self-report rather than clinical information.
† Cultural views are continuous scores ranging from 0 to 100 points. High scores on cultural views indicate a more Eastern view of care; low scores reflect a more Western view of care.
M=mean; SD=standard deviation.

Table 2. Summary of statistics of logistic regression models predicting screening behavior between current and noncurrent screeners

Model Construction	Estimated Coefficient	OR	95% CI	Model χ^2	*df*	$\Delta^{\ddagger}\chi^2$ (vs Compared Model)
Model 1				20.25	1	
Education: >high school (vs ≤high school)	0.96	2.62	1.71 – 4.00			
Model 2				55.00	2	34.75[§] (vs Model 1)
Education	0.77	2.15	1.38 – 3.35			
Physician recommendation: yes (vs no)	1.23	3.41	2.25 – 5.19			
Model 3				57.32	3	2.32 (vs Model 2)
Education	0.72	2.05	1.31 – 3.22			
Physician recommendation	1.22	3.37	2.22 – 5.13			
Symptoms: yes (vs no)[*]	0.35	1.41	0.91 – 2.20			
Model 4				71.64	4	14.32[§] (vs Model 3)
Education	0.62	1.86	1.18 – 2.94			
Physician recommendation	1.24	3.45	2.25 – 5.29			
Symptoms	0.45	1.57	1.00 – 2.48			
Thoughts about getting colorectal cancer: somewhat/often/a lot (vs No)	1.00	2.72	1.59 – 4.67			
Model 5 (final model)				72.34	4	15.02[§] (vs Model 3)
Physician recommendation	1.24	3.44	2.25 – 5.28			
Symptoms	0.55	1.74	1.10 – 2.73			
Thoughts about getting colorectal Cancer	1.03	2.79	1.63 – 4.77			
Cultural views[†]	-.03	0.97	0.95 – 0.99			

The reference group is current screeners. Nonsignificant covariates and predictors were not retained in each model except controlling for symptoms. The final model was significant at $P<.0001$, indicating a good fit to the data.

[*]Data about symptoms were based on women's self report rather than clinical information.

[†]Cultural views are continuous scores ranging from 0 to 100 points. High scores on cultural views indicate a more Eastern view of care; low scores reflect a more Western view of care. For every one-point increase in the cultural scale, the odds of being current screeners were 3% less than being noncurrent screeners.

[‡]The symbol (Δ) denotes the differences in likelihood ratio chi-square (χ^2) tests between the tested model and the compared model.

[§] $P<.001$.

Table 3. Mean differences in cultural views by women with and without college education

Groups\Outcomes	Current Screeners			Noncurrent Screeners			
	Cultural Views						
	n	M	SD	*n*	M	SD	*t* Values
Level of education							
≤High school	51	58.1	10.3	76	62.2	11.2	2.1*
>High school	195	50.5	8.6	111	52.1	8.8	1.5

* $P<.05$.

M=mean scores on the cultural scale; SD=standard deviation. Higher mean scores on cultural views indicate a more Eastern view of care. Low mean scores on cultural views indicate a more Western view of care.

Appendix E

Manuscript:
"Developing and Validating a Measure of Chinese Cultural Views of Health and Cancer"

Developing and Validating a Measure of Chinese Cultural Views of Health and Cancer

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ABSTRACT

BACKGROUND: Cultural values affect cancer screening, yet few instruments exist to measure them in ethnic minorities. This study was designed to develop and validate quantitative scales that measure Chinese cultural views about health and illness.

METHODS: Chinese-American women (N=438) aged 50 and older completed a telephone interview on culture and cancer screening. Cultural views were assessed by a 30-item, 5-point Likert scale. Cultural sub-scales were identified using principal component analysis and validated by their associations with age at immigration and breast, cervical, and colorectal cancer (CRC) screening patterns.

RESULTS: Factor analysis yielded seven cultural sub-scales--fatalism, hot-cold balance, use of herbs, self-care, medical examination, lifestyle, and Western medicine. Reliability of the sub-scales was moderate to high (alphas between 0.39 and 0.82). Except for lifestyle, medical examination, and Western medicine sub-scales, cultural factors were significantly associated with age at immigration ($p<0.001$). Fatalism, self-care, and medical examination sub-scales consistently predicted non-adherence to breast, cervical, and CRC screening recommendations.

CONCLUSIONS: Our findings suggest that Chinese cultural views consist of at least seven domains and may influence older women's use of mammography, Pap tests, and CRC screening tests. Future research is needed to refine and validate these scales in large samples of Chinese Americans.

KEY WORDS: Culture, Asian Americans, Women's Health, Acculturation, Mass Screening, Mammography, Vaginal Smears, Occult Blood, Colonoscopy, Sigmoidoscopy

PRECIS

Data from 438 older Chinese American women indicate that Chinese cultural views consist of at least seven domains and these views influence women's breast, cervical, and colorectal cancer screening practice.

INTRODUCTION

Cultural values have been found to affect cancer communication and screening in several ethnic minority populations. For instance, culturally based fatalistic views about cancer have been reported in African Americans,[1-3] Latinos,[4-5] and Asian Americans.[6-7] Fatalism has also been associated with non-attendance at free breast cancer screening programs for a predominantly Chinese population in Singapore,[8] use of Pap tests in Cambodian and Latina Americans,[4,9] and use of fecal occult blood testing in African Americans.[10] In addition, other culture-specific practices and beliefs, such as use of traditional healers and modesty, have been associated with non-use of screening mammography in Filipino- and Korean-American women.[11]

Traditional cultural beliefs and values are strongly held, particularly among older Chinese Americans.[12] These factors may play a significant role in cancer screening use among older Chinese Americans. Passivity and subordination, for example, are cultural characteristics of traditional Chinese women that can render inappropriate even talking about screening of the cervix or breasts.[12-13] Qualitative research suggests that these values may keep Chinese individuals from seeking Western medicine for help, and they influence conceptions of illness and cancer.[7,12-16]

Although cultural views and values are likely to influence cancer beliefs, attitudes, and behaviors in Chinese Americans, no studies have systematically examined the impact of culture on cancer screening for this ethnic group. One reason for this gap is the lack of valid measures. The limited qualitative data to date suggest that traditional Chinese cultural views may include several constructs, such as fatalism, modesty, and self-care to avoid medical visits,[7,12] and cannot be simply represented by one or a few items. Validated and more comprehensive measures of

culture are needed to understand the influence of cultural views on cancer screening, particularly in light of other known factors, such as physician recommendation and health insurance.[17-19] Although lack of physician recommendation and health insurance have been found to be important barriers to cancer screening, but they cannot explain all variability in screening behavior. Cultural factors, if measured appropriately, will help address this gap in knowledge.

This study was designed to develop and validate quantitative scales to measure Chinese cultural views about health and illness. Items measuring cultural views were derived mainly from focus group data of older Chinese American women.[7] We hypothesized that Chinese cultural views comprise several domains, are measurable, and are associated with level of acculturation. We also hypothesized that these factors independently and collectively influence Chinese American women's breast, cervical, and colorectal cancer screening behaviors.

METHODS

This cross-sectional study was part of a larger randomized controlled trial to improve cancer screening use in Chinese American women. The study protocol was approved by the Institutional Review Board at Georgetown University. Data on cultural views and cancer screening were collected through telephone interviews of Chinese American women recruited from local Chinese communities.

Population, Setting, and Eligibility

The study population was Chinese American women residing in the metropolitan Washington D.C. area. Eligibility criteria included being 50 and older and ability to communicate in Mandarin, Cantonese, Taiwanese, or English. Women who were short-term visitors (i.e. those who planned to stay in the U.S. for less than a year) were excluded because a

long-term follow-up is planned to assess use of cancer screening at 15 months following educational interventions and visitors usually do not receive preventive health care in the U.S.

Recruitment and Data Collection

A convenience sample of participants was recruited from several community-based venues, including Chinese churches, senior centers, health fairs, celebration banquets of Chinese organizations, and Chinese print media. Typically, leaders of the organizations endorsed the project and introduced the research team to the congregation or group. The research team then presented a brief overview of the project, including timeline of assessments, receipt of cancer educational materials, and risks and benefits of participation. Women were encouraged to participate because their views about health and cancer and experiences in preventive care would help understand the needs for cancer control Chinese American women. Interested women were asked to provide a written consent and leave their contact information. Other strategies supplementing the group recruitment method included announcements in church bulletins, invitational flyers or announcements distributed to community organization members, and advertisements posted in local Chinese newspapers and grocery stores. Those women who contacted the research team and expressed their interest in participating in this study were required to mail back a signed consent form. Women providing the written consent received a bottle of brand-name multi-vitamin supplement either on site or by mail as a token of appreciation for participation. Consenting women were then contacted for a 30-minute computer-assisted telephone interview (CATI) by trained Chinese American interviewers. Interviewers received a one-day training first to get familiar with the survey and CATI system, and their initial interviews were supervised by investigators until they could fluently perform the tasks and handle participants' questions well. Eight people conducted the interviews, including

four Mandarin-speaking graduate students, one research assistant fluent in Mandarin and Taiwanese, and three Cantonese-speaking independent contractors. All, except for one student, were females. The majority of the interviews were conducted in Mandarin. Women who did not speak Mandarin were interviewed in their preferred dialects, such as Cantonese and Taiwanese.

Measures

The telephone survey included questions about demographics, health care access and utilization (e.g., regular doctor, prior cancer screening experience, and health insurance), cultural views on health and illness, and knowledge and attitudes towards cancer screening. Women's Chinese cultural views were assessed by 30 items (Table 1). These items were primarily derived fromqualitative data of five focus groups consisting of 54 older Chinese American women who were asked about their views of health, illness, cancer, and cancer screening.[7] In addition, Chen's theory of Chinese American elders' view of health and illness[20] and existing measures, such as beliefs in the balance of "yin and yang" and fatalism[21-22] were incorporated. Responses to each item were assessed on a 5-point Likert scale, ranging from "strongly agree," "agree," "neutral," "disagree," to "strongly disagree." A proxy for acculturation was the question about immigration history: "How old were you when you came to live in the U.S.?"

Women's history of participation in screening for breast cancer (mammography), cervical cancer (Pap tests), and colorectal cancer (fecal occult blood test, sigmoidoscopy, or colonoscopy) was measured by questions regarding whether they ever had each kind of screening test, the date of the most recent test, and the interval between the two most recent tests.[23] The stages of screening for breast and cervical caner were categorized as *regular* or *non-regular*. Regular screeners included women who had a mammogram and a Pap test in the past year and had a previous mammogram and a Pap test within two years prior to the most recent test. Women who

had mammograms or Pap tests beyond this time frame or who never had the tests were considered non-regular screeners. The stage of colorectal cancer screening was characterized into two categories as *current* and *non-current*. Based on the recommendations from American Cancer Society,[24] women who had a fecal occult blood test (FOBT) within a year, a sigmoidoscopy within 5 years, or a colonoscopy within 10 years were defined as current screeners. Women were considered non-current screeners if they ever had a colorectal cancer screening test but beyond the recommended intervals or never had any of the three tests. Women were also asked about whether they underwent each screening test for health reasons (i.e., due to symptoms) or for routine checkups. Women who had undergone the tests for diagnostic reasons were excluded from subsequent analyses.

Analyses

Since it is likely that cultural views include different domains of cultural components,[7,12] we expected that there would be common factors representing higher-order relationships among the 30 cultural items and that some of these relationships might be collinear. Therefore, principal component factor analysis was used to explore the number and composition of factors that accounted for the interrelationships among the 30 cultural items. SAS statistical software was used to conduct the analyses. Factor rotation and inter-factor correlations were allowed by using the Promax rotation option. Factors were extracted if their eigenvalues were greater than 1. Items with loading values equal to, or greater than 0.4 were retained in corresponding factors.

Internal consistency of items retained in each factor was then examined using Cronbach's alpha. If the overall Cronbach's alpha could be improved by 0.05 or more by eliminating individual items in the factor, these items were dropped from the factor. After determining a final set of items for each factor, items were summed to create the individual cultural sub-scales.

For ease of interpretation, individual item scores were recoded before summing so that higher scores represented higher Eastern cultural views of health care. The overall 30-item sum score and the sum score of all cultural sub-scales were also calculated and compared to sum scores of individual sub-scales. Next, sum scores were standardized to a range from 0 to100 points. Records with missing values in more than one-third of the items within one factor were excluded from analyses; otherwise, the prorated factor sum scores were used to maximize the number of subjects in the analyses.

The concurrent validity of these cultural scales was evaluated by their associations with length of time in the US. The predictive validity was examined by associations between cultural sub-scales and cancer screening behaviors. T-tests were used to examine differences in sum scores of individual cultural factors and the overall 30-item scale between women at different screening stages. If sum scores were not normally distributed, non-parametric Wilcoxon tests were used to examine the differences.

RESULTS

Characteristics of the study sample

Of the 533 women who expressed initial interest in participation, 470 (88.2%) completed a written consent. Of the 470 consenting women, 32 did not complete the telephone interview because of lack of interest when contacted again (N=15), ineligibility (N=7) or they stated they were too busy for the interview (N=3), felt uncomfortable talking about cancer (N=3), or they could not be contacted for an interview (N=4). Overall, 438 (82.2% of 533) Chinese women constituted the final study sample. About 22% of participants were recruited from Chinese churches, 16% from senior centers or senior assisted living buildings, 37 % from other Chinese community organizations (e.g., alumni associations, community service organizations, and book

and dance clubs), 12% from health fairs, and 13% from media or referrals from friends who either participated in or supported this study. Eighteen interviews (4.1%) were administered face-to-face in senior centers (n=14), Chinese schools (n=2) or participants' homes (n=2) because of difficulty in completing the interview over the phone or in reaching the participants by telephone. In addition, 3 participants completed the baseline survey and returned them by mail because they were too busy to set aside time for a telephone interview. A few interviews were conducted in languages other than Mandarin: Twenty-five were conducted in Cantonese, five in Taiwanese, and four in Fuzhou, and two in English.

Of the 438 participants, 437 were foreign born. The only woman born in the U.S. was raised up in a Chinese-speaking environment. Among the foreign born women, sixty-one percent were born in China, 3% in Hong Kong, 31% in Taiwan, and 5% in other countries including Singapore and Vietnam. The mean age of the sample was 64 years (standard deviation, SD = 9 years; range: 50 to 89 years). The majority of participating women had a college degree or higher (71%), had health insurance (80%), and was married (73%). Thirty-nine percent were employed. The mean age upon immigration was 42 years (range: 0 to 80 years). Fifty percent of the participants regularly obtained mammograms or Pap tests, and 75.8% ever obtained at least one of the three colorectal cancer screening tests (i.e., FOBT, flexible sigmoidoscopy, and colonoscopy).

Factor analysis results

Results from principal components analysis initially extracted 9 factors. We reviewed the loadings of items and considered the theoretical connection between items within factors. Items that either loaded less than 0.40 in any of the factors or had theoretically weak associations with other items in the factor were eliminated for the analyses. For instance, the item describing

avoidance of medical visits in order not to become sick or have bad luck (BAD_LUCK) was deleted due to low loading values on any of the factors. Items on eating prepared food (FOOD_KEY) and body type and illness (BODY_CAN) were clustered together at 0.58 and 0.76 and form one factor, but this factor was excluded because no meaningful construct could emerge from these two items. The item about Qi-Kung or Tai-chi practice (QI_KUNG), loaded at 0.82, was not considered for further analyses because it was the only significantly loaded item in that factor.

After these deletions, data were analyzed again using principal components analysis with Promax rotation. The results showed that the remaining 26 items significantly loaded on seven common factors (Table 2). The first factor contained nine items, all of which were related to individuals' perception that health and illness are predetermined and beyond their control. This factor was labeled as "fatalism." "Use of herbs" contained three statements about the advantage of using Chinese herbal medicine to stay healthy; "self-care" contained three statements that emphasized taking care of one's self as opposed to depending on doctors; "lifestyle" represented the notion of keeping healthy through outdoor exercise, balanced diet, regularity, and maintaining emotional stability. "Medical examination" contained statements about negative perceptions about medical examination. "Hot-cold balance" represented the belief about the importance of a hot-cold balanced diet in health maintenance. "Western medicine" consisted of two items about negative impressions of Western medicine--the use of chemical components that may harm the body and the inability to prevent disease. After rotation, the seven factors were distinct from each other and the correlations between the factors were low to moderate (Table 3). Analyses using an orthogonal rotation (i.e., Varimax rotation in the SAS program) yielded the same seven factors.

Reliability (internal consistency)

The statement "I know my body better than any one else (BDY_BEST)" was eliminated from the "self-care" factor since dropping this item increased the inter-item correlation for this sub-scale (Cronbach's alpha) from 0.63 to 0.73. The reliability of the overall 30-item and the final seven- factor (25 items) sum scores were 0.79 and 0.80, respectively (Table 4). The Cronbach's alphas in the "fatalism" and "self-care" factors were 0.82 and 0.73, respectively, which was about the same level of those in the overall and seven-factor sum scores. The intra-item correlations among items in the "use of herbs" and "lifestyle" factors were moderate (Cronbach's alpha= 0.69 and 0.59, respectively), but were low in the "hot-cold balance," "medical examination" and "Western medicine" factors (Cronbach's alpha=0.53, 0.42, and 0.39, respectively).

Concurrent validity

Except for "lifestyle," "medical examination" and "Western medicine" factors, individual factor and overall sum scores were significantly associated with participants' age upon immigration to the U.S. (Spearman correlation coefficient between 0.17 and 0.34, $p<0.001$); women who held stronger Chinese cultural views were more likely to have come to the U.S. in the later years of their life (Table 4).

Preliminary predictive validity

The seven-factor (25 items) sum scores and overall 30-item sum scores significantly differentiate women of different breast, cervical, and colorectal cancer screening stages (Table 5): women who did not obtain regular mammography and/or regular Pap tests were likely to have a more traditional Chinese cultural views than those having regular mammography and/or

Pap tests (t-tests, $p<0.0001$). Similarly, those whose colorectal cancer screening tests were not current held a more traditional cultural view than those never having or having current colorectal cancer screening (t-test, $p<0.01$).

Of the seven cultural scales, fatalism and self-care were the two strongest factors differentiating women having regular and non-regular breast and/or cervical cancer screening tests. Women who did not adhere to breast and cervical cancer screening recommendations were more likely to have a fatalistic view, to emphasize self-care, and to ignore the importance of medical checkups ($p<0.0001$). The "use of herbs," "hot-cold balance," and "medical examination" factors had a similar effect on breast and cervical cancer screening as those found in the "fatalism" and "self-care" factors, but with a lesser degree of significance. Similar to those found in breast and cervical cancer models, the "fatalism" and "self-care" factors were associated with colorectal cancer screening, with the non-current screeners having higher mean scores than current screeners (45.1 and 50.7, compared to 38.8 and 40.0; t-tests, $p<0.001$).

Analyses of the associations between the five items not included in any of the factors and cancer screening show that women who believe that if a woman visits clinics too often, she will catch diseases and have bad luck (BAD_LUCK) were less likely to obtain regular mammograms and Pap tests (Wilcoxon tests, $p<0.01$). Also, a positive attitude toward Qi-Kung and Tai-Chi in preventing disease (QI_KUNG) was associated with non-regular mammography use (Wilcoxon test, $p<0.01$).

DISCUSSION

To our knowledge, this is the first study to develop a measure of Chinese cultural views on health and illness and to validate cultural scales by testing their association with Chinese women's breast, cervical, and colorectal cancer screening. Our findings suggest that Chinese

cultural views consist of at least seven domains thatmay influence older women's use of cancer screening tests to differing degrees.

Predictive validation tests further indicate that the values captured by these seven cultural sub-scales have different degrees of influence in Chinese women's cancer screening behaviors. The significant relationship between the fatalism sub-scale and breast and cervical cancer screening in our Chinese population was consistent with prior research on the effect of fatalism on cancer screening in other Asian, African American, and Latino populations.[4,8-10] The consistently strong association between fatalism and screening outcomes is likely also a reflection of the higher internal consistency of this subscale relative to the other subscales described here.

Although exercise, diet, and the emphasis on social and emotional health clustered together, these "lifestyle" values did not predict cancer screening. However, more specific concepts about food, such as the importance of choosing the right food to maintain the hot and cold balance of the body, were associated with cancer screening behaviors. In Chinese culture, foods are labeled as hot or cold based on their effects on the body, not necessarily by the temperature when served. People with a hot body type need to consume cold food (e.g., Napa cabbage and mung beans), and those who are weak or feel cold need hot food (e.g., beef and ginger). This concept is influenced by the teaching of Taoism, which divides the universe into two opposite characters--"yin" and "yang." "Yin" is cold, dark, passive, and weak, whereas "yang" denotes the hot, light, active, and strong side of a person.[12] The ability to balance "yin (cold)" and "yang (hot)" is considered the optimal way to achieve health and prosperity. Women who believed in the hot-cold balance of the body had impression that they were healthy

as long as their diet was balanced. This culture-specific belief may explain why these women were less likely to adhere to breast and cervical cancer screening guidelines.

We found associations between adverse impressions of Western medical examinations (embarrassment, lots of unnecessary tests, and intrusiveness) and non-adherence to regular breast and cervical cancer screening. This result is consistent with limited studies that have found that the invasive nature of Western medical approaches keep some Chinese women from seeking recommended care.[25]

Although some cultural sub-scales show significant associations with colorectal cancer screening behavior, the associations are moderate compared to those found with breast and cervical cancer screening. It is possible that the influences of cultural factors on cancer screening are more evident in screening adherence, a stage that is not available in our current colorectal cancer screening data. In addition, subset analyses of our data show that women whose colorectal cancer screening tests were not current had the highest cultural scores than those having current tests or never having any tests. It is likely that traditional Chinese cultural views keeps women from repeating screening tests, and that other reasons, such as lack of knowledge about screening recommendations, also contribute to women's never having any colorectal cancer screening.

Several limitations of this study should be considered when interpreting the results. First, the 30-item cultural view scales were developed primarily from responses of Chinese American women aged 50 and older to questions regarding their perceptions about health and illness/cancer and their experiences in health care in the U.S..[7] It is possible that other aspects of cultural views held by Chinese Americans were not captured. However, if these seven domains of cultural views can remain stable after being tested in different groups of Chinese women, it is unlikely

that any unidentified domains will alter the relationships between these seven factors and cancer screening. Second, except for the fatalism scale, these cultural scales only included two to three items, which may partly explain moderate to low intra-item reliability among items in these sub-scales. Future research is needed to improve reliability of these specific cultural scales. One possible method is to add more items describing specific cultural views, and to test in larger samples whether items of the same constructs will cluster together and improve internal consistency. Third, the low reliability of several of the subscales likely attenuated their associations with our screening outcomes. Despite the low reliability of several subscales, the overall scale had acceptable reliability. Thus, some investigators may wish to consider using the overall scale score rather than focusing on individual subscales. Fourth, the generalizability of this study is limited by the use of a convenience sample drawn mainly from Chinese community organizations, churches, and senior centers. Although mass media were used to encourage participation, relatively small numbers of women participated through this channel. Therefore, women who did not attend any activities or programs held by Chinese organizations, such as restaurant workers or those speaking in other Chinese dialects, are likely to be underrepresented in our sample. Cultural patterns as well as their associations with cancer screening behaviors may be different if these people are included. The stability and generalizability of the cultural scales needs to be tested in men and Chinese populations in other geographic areas. In addition, measures of cancer screening behaviors are subject to self-report bias.

Despite these limitations, our findings of the associations between cultural views and cancer screening practice have important implications for research and practice. Cancer screening programs targeting Chinese women may be more successful if they acknowledge women's cultural barriers and include messages that address those cultural factors. Research is

needed to explore how the concept of early detection can be accepted by women holding a fatalistic outlook. Likewise, health care providers should be sensitive to the cultural values of their Chinese patients, especially those who are older immigrants, and address their concerns that may keep them from following advice to get mammograms and Pap tests. Studies should explore prospects for education and/or counseling interventions that would improve Chinese women's cancer screening adherence in large representative samples. In addition, since screening behaviors are also influenced by other factors, such as knowledge about cancer and cancer screening, perceived risks of getting cancer, physician recommendations, and health insurance coverage, it is necessary to test whether the relationships between cultural views and cancer screening still hold true after considering those important mediating factors.

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