HHS Public Access

Author manuscript

Am J Health Behav. Author manuscript; available in PMC 2019 July 12.

Published in final edited form as:

Am J Health Behav. 2009 ; 33(6): 650–660.

Cancer Screening Behaviors and Barriers in Asian Americans

Grace X. Ma, PhD [Professor],
Department of Public Health, Director of Center for Asian Health, College of Health Professions, Temple University, Philadelphia, PA

Steven E. Shive, PhD [Research Faculty],
Center for Asian Health, College of Health Professions, Temple University, Philadelphia, PA

Min Qi Wang, PhD [Professor], and
Department of Public and Community Health, University of Maryland School of Public Health, College Park, MD.

Yin Tan, MD, MPH [Research Project Manager]
Center for Asian Health, College of Health Professions, Temple University, Philadelphia, PA

Abstract

Objectives: To determine differences in screening for routine physical exam and cancers among Chinese, Korean, Vietnamese, and Cambodian Americans.

Methods: The sample consisted of 2011 participants. Chi square was used to identify relationships between demographic/acculturation factors and screenings.

Results: Neverscreened rates were high for all Asian subgroups. Never-screened rates for mammography ranged from 20.1% to 78.5%; for Pap test, 28% to 75.6%; for prostate cancer, 56.7% to 97%; for colorectal cancer, 65.3% to 94.9%. Koreans had the highest never screened for health checkups (34.7%).

Conclusions: Efforts should be made to comply with screening guidelines among Asian Americans.

Keywords

cancer screening; Asians; Koreans; Chinese; Vietnamese; Cambodian; mammography; Pap test; colorectal; prostate; hepatitis B

Approximately 13 million Asian Americans reside in the United States, and despite a 72% population increase in the last 10 years,[1] these ethnic populations have often received little attention. [2] There is an assumption that Asian Americans are at low risk for developing cancers due to the aggregation of data for more than 60 Asian nationalities into one category, which thereby masks their cultural and health status differences.[3] Cancer is the number one cause of death among Asian American women,[4] and these women have the lowest screening rates of all ethnic groups in the United States.[5] Incidence and prevalence rates (per 100,000)

Address correspondence to Dr Ma, Department of Public Health, College of Health Professions, Temple University, 1700 N Broad Street, 304 Vivacqua Hall, Philadelphia, PA 19122-0843. grace.ma@temple.edu.

are reported for Asian Americans as breast cancer (incidence 88.6, mortality 12.6), cervical cancer (incidence 8.2, mortality 2.5), colorectal cancer (men's incidence 51.2, mortality 15.4; women's incidence 35.7, mortality 10.5), liver (men's incidence 20.9, mortality15.6; women's incidence 8.0, mortality 6.8), prostate (incidence 96.8; mortality 1 1.3).[6] Cancer and screening rates vary by Asian American subgroups.[7,8] The purpose of this study was to determine differences in screening rates during general physical exams and for breast cancer, cervical cancer, colorectal cancer, prostate cancer, and liver cancer (hepatitis B) among Chinese, Korean, Vietnamese, and Cambodian Americans. Further, the Asian Americans were assessed in community settings and included those with poor English fluency, often excluded in national studies.

Mammography

Breast cancer is the most frequently diagnosed cancer among Chinese and Korean women, second for Vietnamese,[9] and third for Southeast Asians taken together.[16] Asian women are at higher risk the longer they live in the United States.[10] Mammogram screening rates among whites are the highest at 72.1%.[11] The American Cancer Society and others recommend that all women who are 40 years and older should have an annual mammogram.

Among Asian women, 71.7% (95% CI, 66.3–77.0%) aged ≥50 years had a mammogram in the past 2 years, and 69.5% (95% CI, 63.9–75.1%) had a clinical breast exam.[9] Women who had health insurance and had seen a physician in the past year were more likely to have been screened. Screening rates vary by Asian subgroup including Chinese (61% to 74.0%),[12,13] Koreans (38.6%−78%),[14,15] and Vietnamese (26%−56%).[17–19]

Pap Screening

Cervical cancer is one of the most preventable cancers,[20] yet 50% of new invasive cases occur in women who have never had a Pap test.[21] US Korean and Vietnamese women have higher age-adjusted cervical cancer incidence and mortality rates than do white women, and there are Asian subgroup differences.[8] For example, the incidence rate for invasive cervical cancer is 4 times higher among Vietnamese women than among all the Asian groups combined.[7] Guidelines call for screening of all sexually active women, starting within 3 years after onset of sexual activity, and all women over age 21 should have an annual test until age 30. After age 30, women who have had 3 consecutive satisfactory and normal/negative Pap tests may be screened every 2 to 3 years if they meet certain criteria.[22]

Findings indicate that 73.7% of all nonhysterectomy women age 18 and older had a Pap test in the past 3 years,[9] and screening was associated with having a higher education, higher household income, being unable to work, having seen a physician in the past year, and having health insurance.[9] Higher cervical cancer incidence and mortality rates are associated with lower socioeconomic status.[23,24] Low Pap screening rates are associated with lack of contact with a primary care provider in the past year, no usual source of care, low family income, low educational attainment, and unmarried status.[9,25]

Asian women are the most likely to go without a Pap test (40%), nearly twice the rate of white women (21%). Approximately twice as many foreign-born women have not had a Pap

test compared to women born in the United States, and those least likely to get regular Pap tests include women born in North or South Korea (46(%) and China (43%).[26] There are Asian subgroup differences in Pap screening. Approximately 60<% of Koreans, [14] 52% to 67% of Vietnamese, [18,19] and 67% of Southeast Asian women aged ≥18 years have ever had a Pap test.[18,19]

Colorectal

Colorectal cancer (CRC) is the third leading cause of cancer and the second leading cause of cancer death.[27] Among Asian Americans, CRC is the second most commonly diagnosed cancer and is the third cause of cancer-related mortality.[28] The American Cancer Society recommends that, beginning at age 50, people should have (1) a fecal occult blood test (FOBT) every year and a flexible sigmoidoscopy every 5 years, (2) a colonoscopy every 10 years, or (3) a double contrast barium enema every 5 to 10 years. Despite the proven benefits of colorectal cancer screening tests, studies reported that 43.4% of persons aged 50 years or older have received CRC screening.[29] The lowest rates of screening are among Asian Americans at 34.8%.[30] Non-Latino whites had the highest rate of overall CRC screening (75%), and FOBT (58%) and endoscopy(57%) in particular.[28]

Hepatitis B (HBV)

There are 1.25 million HBV chronically infected Americans, with an annual incidence of 130,000 cases, and[31,32] approximately 5000 people die each year from HBV-related liver complications. HBV is the most common cause of cancer death among Asians,[33] with 10% of Asians infected. The earlier the infection, the higher probability of being a chronic carrier. [34–36] Male Chinese American infection rates are 6 times higher than they are among whites, [8] and the chronic HBV infection rate among Vietnamese is between 7 and 14%.[37] Approximately 46% of Chinese report knowing that HBV causes liver cancer, but only 35% reported that they had been screened,[38–40] with 48% of immigrants receiving a HBV blood test.[39,40] Southeast Asians have higher liver cancer rates than any other ethnic group in the United States, yet the HBV screening rate for this group was only 8.8% for Vietnamese.[41,42]

Prostate

Although US prostate cancer deaths have decreased by 4% from 1994 to 2002,[43] prostate cancer is one of the most common found in males in the United States, accounting for 80% of all deaths in men 70 years of age and older, 33% of all male cancer cases, and 10% of all male cancer deaths.[19,44] Prostate cancer is the second leading cause of cancer deaths among men in the United States and the sixth leading cause of death overall.[43] Among Asian men the mortality rate is 11.8/100,000 in the United States.[45] Further, the incidence of prostate cancer and its subsequent mortality have been increasing in Asian countries (1978–1997), ranging from 5–118%.[46] Singaporean Chinese reported a 118% increase in incidence, and Korea (2001 incidence rate of 7.9/100,000) reported a 260% increase in mortality during this time period.[47] Prostate cancer differentially impacts Asian American subgroups. Among Asians, Koreans (24.2/100,000) carry the heaviest burden.[19] The American Cancer Society recommends that beginning at age 50, a prostate specific antigen blood test (PSA) and

digital rectal examination (DRE) should be performed annually. Among Vietnamese men over the age of 45, only 8.4% received a PSA and only 3.4% had a DRE. There are few prostate screening studies among Asian American subgroups.

Major barriers to greater understanding of cancer prevention among Asian Americans include a lack of sufficient and representative data as well as administration of national surveys, which tend to be conducted only in English. The monolingual nature of national surveys leads to an underestimation of rates of cancer screening among Asian Americans[3] by failing to include those who speak little or no English. In addition, insufficient sample sizes hinder a detailed analysis for most Asian American subgroup comparisons.

METHODS

Sample

To obtain a representative sample of Chinese, Korean, Vietnamese, and Cambodian Americans, a current listing of 111 Asian community organizations in the region of greater Philadelphia, New Jersey, and New York City was identified by the Asian Community Cancer Coalition and staff of the Center for Asian Health, Temple University. These organizations were located in geographic areas that maximized the coverage of Asian Americans across ethnic groups, age, and socioeconomic status. Asian community organizations (N=52) were randomly selected from the 111 organizations. A proportional sampling procedure was adopted based on the size of the 4 ethnic groups.[48] However, the Cambodian group was oversampled due to the small population size. About 2242 participants were invited from the 52 Asian community organizations to participate in the study, of which, 2098 were eligible and agreed to participate. Among the recruited eligible participants, 2011 completed the study, a response rate of 95.9%. The final sample of 2011 consisted of 45.9% Chinese (n=925), 19.1% Koreans (n=384), 18.1% Vietnamese (n=362), and 16.9% Cambodians (n=340). The data collection protocol was approved by the Temple University Institutional Review Board (IRB).

Adult Asian Americans (Chinese, Korean, Vietnamese, and Cambodian) 18 years of age or older and able to read materials written in English or in their respect Asian language at a fifth-grade level were eligible to participate in the study. The sample size was determined by using GPOWER, a priori power analysis software program.[49] The GPOWER program can determine the needed sample size for a given statistical test (chi-square, t test, etc), the alpha level, the estimated effect size, and the desired power values. Based on the chi-square statistical test, the alpha level of .05, the conservative effect size of 0.25 that is indicated in most behavioral studies,[50] and the commonly accepted minimum power of 85%, the sample size was calculated as 197 per group (GPOWER estimate: alpha=.05, df=3, power = .85, lambda = 14.22, critical chi = 7.81). The final sample collected for this study actually reached our goal, and each of the 4 subgroups exceeded 85% statistical power.

Design and Data Collection Procedures

A cross-sectional research design was used in the study because of the common advantages this design provides such as collecting information from a large number of diversified

participants.[48,50] Data collection was carried out between June 2005 and October 2006. Data collection and administration trainings were provided to all survey administrators as well as to on-site bilingual translators. The research team, in collaboration with community leaders, recruited eligible participants from community organizations' facilities. Eligible participants provided written informed consent to participate in and complete the study. The survey was administered by using face-to-face instruction methods. The instructions on the questionnaire were read aloud by data collection administrators to enhance the understanding of procedures for completion of the survey. Participants had the choice of responding to the questionnaire in English or in their native language (Chinese, Korean, Cambodian, or Vietnamese). Language assistance was provided during the survey administration. The questionnaire required approximately 25 minutes to complete.

Measurements

A multilingual questionnaire was developed. The questionnaire was backtranslated and pilot tested for reliability, validity, and cultural appropriateness. The 95-item questionnaire was composed of 6 sections. The questionnaire contained items that included the following variables: (1) demographics (age, gender, foreign born, ethnicity, marital status, education level, employment status, income, health insurance) and acculturation (English language competency and native foods), (2) screening behavior (mammogram for breast cancer, Pap smear for cervical cancer, screenings for prostate cancer, hepatitis B/liver cancer, and colorectal cancer, an d routine health exam), (3) perceived barriers, (4) health perceptions based on the health belief model (susceptibility, severity, benefits, barriers, cues to action, and self-efficacy), (5) access to health care (physician visits, language concordant physician), and (6) satisfaction with access to health care.

A pilot test was conducted to establish reliability and validity of the instrument and to verify data collection methods. In addition, appropriateness of the questionnaire format, content validity, the level of difficulty, and length of time to take the survey were determined. Face and content validity of the questionnaire was tested with 37 Asian American adults who did not participate in the study. The test-retest method was used to establish reliability. The reliability test was done with Kendall's tau-b test for categorical variables and correlation for continuous variables. The reliability coefficients were high, indicating that overall, participants responded consistently to questionnaire items. The following test-retest correlations were obtained for respective items: mammogram screening (.69), Pap test (.63), prostate cancer screening (.63), hepatitis B screening (.85), and colorectal cancer screening (.84), reasons for obtaining screening (.54), barriers to getting screened (lack of knowledge . 57, feel well .81, language .69, no regular doctor .46, no time .66, no place to get it 1.0, no transportation .60, no insurance 1.0, insurance does not cover .79, fear of bad test .69, and embarrassment or shame .69), items related to family history, getting *free* screenings, and discussing with the family (.87), and demographics (year born .98, gender 1.0, born in the United States 1.0, years lived in the United States 1.0, degree of education .97, employment . 81, covered by insurance 1.0, level of English .87, watch TV in English 1.0, and income level .85). Also, based on the findings of the pilot study, certain questionnaire items were deleted, whereas others were combined to create a shorter version of the questionnaire.

Data Analysis

Because the measurements of all variables were categorical, contingency tables and chi-square tests were conducted to examine bivariate relationships. For the purpose of this article, 2 areas of analyses were adopted. First, the relationship between each demographic/acculturation factor and ethnicity group was examined with chi-square analysis. Additionally, the percentages across the 4 ethnicities were reviewed to identify group differences.

Second, the relationship between each cancer screening variable and ethnic group was examined with chi-square analysis. The prevalence of cancer screening associated with each ethnicity was examined in order to identify highrisk ethnicities. For each chi-square test, significance was set at $P<.05$. All the analyses were performed using SAS Software (version 9.1.3).

RESULTS

Table 1 presents the percentages and chi-square results for each demographic factor and ethnic group. All chi-square tests were significant ($P<.05$) except marital status. Cambodians (23.8%) and Vietnamese (22.1%) had a higher proportion of older adults at age 65 or older than did Chinese and Koreans. Data showed that more Chinese (21.8%) and Koreans (24.7%) were recent immigrants than Vietnamese and Cambodians, as indicated by “living in the U.S. less than 6 years.”

More than half (52.1%) of Cambodians reported no education or elementary school education whereas Koreans reported the highest educational level with more than 60% having a university or higher education and 30.3% reporting a high school education. The employment status of the 4 ethnicities seemed to be consistent with the educational patterns, with Koreans reporting the lowest proportion of unemployment (3.9%). Interestingly, the proportion of employment yielded no visible difference across the 4 groups, ranging from 59% to 66%. A drastic difference was found for annual household income. A higher proportion (17.7%) of Koreans reported annual household incomes above $40,000 whereas only 4.2% of Cambodians reported incomes above $40,000. The Cambodians also had the highest proportion (68.8%) of self-reported annual household incomes of less than $10,000 among the 4 ethnic groups.

Asked whether they currently have health insurance, more than half of Korean (53%) and Cambodian (55.7%) respondents reported that they did not have health insurance. On the contrary, the majority of Vietnamese (82.8%) reported having health insurance, followed by Chinese (68.3%). Reported regular physician visits seemed to be consistent with current health insurance status among these ethnic groups, although Koreans reported the highest proportion (52%) of no regular physician visits and Vietnamese reported the lowest proportion (16.2%)

The rate of speaking English between the physician and patient ranged from 75.7% to 16.7%, with Cambodians ranked the highest and Chinese ranked the lowest. The rate among Cambodians is more than 3 times that among Koreans (23.5%) and Vietnamese (21.2%).

Cambodians also had the highest proportion of non-English speakers (73.2%) among all ethnic groups. The proportion of people with higher levels of spoken English is relatively equal between Chinese and Korean groups, indicated by 29.3% of Chinese and 30.6% of Koreans reporting that they spoke English well or very well.

All 4 ethnic groups reported high proportions of watching TV/movies in their native language with Cambodians the highest (95%), followed by Vietnamese (83.4%), Chinese (79.1%), and Koreans (63.4%). For other mass media usage, Chinese reported the highest proportion (90.4%) of reading newspapers in their native language, and Cambodians reported the lowest proportion (37.3%). In addition, more than half of Cambodians (60.6%) also reported not reading a newspaper at all; this rate is more than all the other ethnic groups rates combined.

When assessing Internet usage, most Cambodians (80.9%) reported that they did not often use the Internet for sources of information. Neither Chinese (62.7%) nor Vietnamese (61.6%) relied heavily on the Internet as an information source. On the contrary, Koreans had the highest proportion (73.7%) of using the Internet as a source of information. All 4 ethnic groups demonstrated high proportions of surfing the Internet using their native language. Koreans were the highest (85.7%), followed by Cambodians (84%), Chinese (79.8%), and Vietnamese (73.5%).

More Koreans (49.7%) and Cambodians (43.4%) reported visiting current primary physicians in the last 12 months than did Chinese (23.5%) and Vietnamese (26.5%). More than half (62.5%) of Vietnamese respondents reported that they had visited their primary physician 1–2 times in the last 12 months, followed by Cambodian s (45.8%), Koreans (36.5%), and Chinese (35.6%). Overall, rates of visiting a physician more than 3 times in the past year were relatively low among all 4 ethnic groups.

Table 2 presents the prevalence and significance test for each of the 5 cancer screening and routine health exams in relation to the ethnic groups. All 6 variables were significantly associated with the ethnic group, $P<.0001$. The screening rates for never screened were high for all Asian groups. For mammogram-breast cancer screening, the proportion (78.5%) of never screened for Cambodians was more than double that of any other ethnic group. Chinese had the lowest proportion (20.1%) who reported never screened. Cambodians had the lowest rate (11.4%) of compliance among those who reported being screened within 12 months.

A similar finding was found for the Pap smear-cervical cancer screening. Again, Cambodians had the highest proportion (75.6%) of never screened among all ethnicities. Chinese had the lowest proportion (28.0%) who reported as never screened. Almost all Cambodian men (97%) reported no prostate cancer screening, followed by Vietnamese (88%) and Koreans (78.9%). The lowest proportion of never screened was found for Chinese, which was still greater than 50%. The screening for hepatitis B was a dichotomous measure (never screened vs screened) for all samples aged 18 or older. All 4 ethnicities had more than half reporting never screened, with Cambodians having the highest proportion (89.4%).

When asked about colorectal cancer screening, all 4 ethnic groups had substantially higher rate for never screened compared with other racial ethnic groups. Cambodians had the highest proportion (94.9%) of never screened among all ethnicities, and Chinese had the lowest proportion (65.3%). Among those who obtained routine health exams, all 4 ethnicities had substantially lower numbers who reported never screened compared with other cancer screenings. Koreans had the highest never-screened proportion (34.7%)) out of the 4 ethnicities. Among Asian Americans who were screened for cancer, there was a large percentage who were not compliant with current guidelines for mammograms (22.8%), Pap tests (23.8%), or prostate (7.5%) or colorectal (7.9%) screening. There were subgroup differences in noncompliance for particular cancers.

DISCUSSION

The purpose of this study was to identify and describe Asian American subgroup differences in demographic and acculturation factors, in cancer screening use for breast, cervical, prostate, liver, colorectal cancers and routine health screening, and to include non-English competent Asians. Differences were found for age, years lived in the United States, education level, employment status, annual household income, having health insurance, having a regular physician, having a language concordant physician, English competency, viewing media in native language, using the Internet as a source of information, using native language for the Internet, and frequency of visits to primary providers in the last year. For example, Koreans were more likely to be recent immigrants, to have a higher educational level, to be employed, to view media in English, and have the highest use of the Internet. However, about 49.7% of Koreans reported never visiting a primary physician in the last year, and 53% reported that they did not have health insurance. Although Koreans appeared to have better economic status compared to other groups, it did not translate into access to health care services.

Although the study did not determine type of employment (eg, self-employment), one explanation for lack of insurance despite their annual income levels and employment status may be that some Koreans were self-employed and found it difficult to obtain insurance. Future studies could examine insurance coverage and type of employment for Asian Americans. The Chinese likewise reported higher socioeconomic status compared to Vietnamese and Cambodians but were more likely to visit a primary care physician than Koreans. Cambodians were the least educated and were more likely to be unemployed, to have the lowest incomes, not to have insurance 55.7% uninsured), not to have a native language concordant physician, not to speak English at all, to view media in their native language, and not to use the Internet for information. These relatively poor socioeconomic indicators for Cambodians and the fact that more than half did not have medical insurance may help explain why they had the poorest cancer screening rates. The association of low socioeconomic status and low screening rates have been documented.[24,51] Low socioeconomic status is also associated with poor access to health care.[25] Vietnamese (82.8%) and Chinese (68.3%) were more likely to report having medical insurance and did report higher rates of cancer screening than Koreans and Cambodians, lending support for the importance of having insurance. [3,9] The results also showed that among Vietnamese

women, 24% of those with insurance never had a mammogram, whereas 72% of those without insurance had never had a mammogram.

Cancer Screening

Despite the evidence indicating that cancer screening or early detection is effective in reducing mortality, previous studies have identified underuse of screening by Asian Americans,[8,9,44,52] predominantly among those who have English competency. The majority of previous studies have been based on the behavioral risk factor surveillance survey questions, and monolingual Asians are generaly excluded in national studies due in part to language limitations.[3]

Although low socioeconomic status is associated with low cancer screening and reduced access to health care, the screening use rates were low for all Asian groups. Overall never-screened rates were reported for mammography (33.6%), Pap tests (37.7%), prostate screening (78.2%), HBV (71.4%), and colorectal cancer (79.1%) by the 4 Asian groups. These are lower rates than those reported for whites.[8,9] In addition, subgroup differences in screening rates were found. Cambodians were the least likely to get screened for breast, cervical, prostate, and colorectal cancer. Chinese were the most likely to get screened for these cancers, followed by Vietnamese for mammograms and Pap tests and by Koreans for prostate, HBV, and colorectal cancer screenings.

Although Chinese and Korean screening rates were better compared to other Asian American subgroups, when compared to whites, their rates were poor. For example, white women were more likely to get breast cancer screening within the past year, including, mammograms (61.9%), clinical breast exams (67.1%), or both (55.3%), than were Asian women.[45] Further, the high proportion of never screened for prostate cancer (78.2% in men 50+ years), colorectal (79.l % in men and women 50+), and HBV (71.4% in men and women 18+) is disturbing given the benefits of early detection for these cancers. These rates suggest the need for appropriate interventions to increase early cancer detection and preventive care among these populations and the need for navigation through the health care system. Noncompliance rates were also high among those Asians who ever received screening. Men and women who are noncompliant may be different from those who have never received screening. There is a paucity of information regarding noncompliance for cancer screening tests among Asian American subgroups. There may be subtle differences between never screened and those who have been screened but are noncompliant with current guidelines.

Chinese (83.3%), Vietnamese (78.8%), and Koreans (76.5%) have high rates of speaking their native language with their physicians, compared to Cambodians (24.3%). This may help explain in part poor Cambodian screening rates compared to Chinese, Vietnamese, and Korean rates. Language-concordant patients have better health-related quality of life.[53] Many physicians rely on limited foreign language skills or on untrained interpreters.[54] Physician-patient communication without an interpreter is recognized as a major challenge to effective health care delivery.[53,55,56]

There were 2 limitations to this study. First, as a result of the cross-sectional design, cause and effect relationships could not be determined. For example, it is difficult to determine if demographic or cultural influences have an effect on screening with such a design. Second, the self-report did not allow determination of the veracity of responses and was subject to desirability bias. Yet, as a result of these biases, an overestimate of the frequency of screening may mean there are even lower rates of screening than reported.

This descriptive study adds to the evolving literature on cancer screening among Asian Americans, especially in the region of greater Philadelphia, New Jersey, and New York City, and is one of the first studies to examine differences in demographic and cultural factors, as well as cancer screenings among 4 predominantly non-English-speaking Asian American subgroups. Chinese, Koreans, Vietnamese, and Cambodians who have low screening rates may present themselves at late stages of cancer growth, thereby increasing their cancer risks.

To meet the Healthy People 2010 screening objectives, which include mammograms (70%), Pap tests (97% ever receive, 90% receive within preceding 3 years), and colorectal screening (FOBT 50’%, sigmoidoscopy 50%), in the respective age-groups, cancer education and interventions are needed to address cancer health disparities among these subgroup Asian populations, particularly the ethnic groups who have the highest neverscreened rates (eg, Cambodians). Programs developed for Asian American s should take into account the need to provide a range of culturally and linguistically appropriate interventions. Based on our research evidence, interventions tailored to the specific Asian ethnic group’s cultural, socioeconomic, and psychosocial factors have a greater effect on promoting health behaviors such as cancer screening than does general health education.[57] Identification of factors associated with successful promotion of cancer early detection and preventive care could positively influence long-term maintenance of health-seeking behaviors. It is imperative that future research focus on this area.

Acknowledgments

The authors wish to thank Asian Community Cancer Coalition partners, volunteers, community coordinators and research team at the Center for Asian Health, Temple University, who facilitated and supported the completion of the study. This research was supported by NIH-NCI’s Community Networks Program, grant U01 CAl14582 ATECAR-Asian Community Cancer Network (Grace X. Ma, PhD, Principal Investigator) and by NIH-NCI’s grants R01CA129763 and RO1CA111570 to Dr Grace Ma (PI).

RFERENCES

1. U.S. Census Bureau Website 2000. 2000 US Census: Current Population Survey (online) Available at: http://www.census.gov/population/www/socdemo/foreign.html. Accessed October 21, 2007.
2. Kuo J, Porter K. Health status of Asian Americans: United States, 1992–94. Adv Data 1998;298:1–16.
3. Kagawa-Singer M, Pourat N. Asian American and Pacific Islander breast and cervical carcinoma screening rates and healthy people 2000 objectives. Cancer 2000;89(3):696–705. [PubMed: 10931471]
4. Chen MS Jr., Koh HK. The need for cancer prevention and control among Asian Americans and Pacific Islanders. Asian Am Pac Isl J Health 1997;5(1):3–6. [PubMed: 11567379]
5. American Cancer Societv. Cancer Facts and Figures 1998 Atlanta, GA: American Cancer Society 1998 Publication no. 5008.98.

6. SEER Cancer Statistics Review, 1975–2003 National Cancer Institute, Bethesda, MD. Cancer 2005;103:1457–1467. [PubMed: 15712273]
7. National Cancer Institute 2003. Cancer Health Disparities (online) Available at: http://www.cancer.gov/newscenter/healthdisparities. Accessed October 21, 2007.
8. Miller BA, Kolonel LN, Bernstein L. Racial/Ethnic Patterns of Cancer in the United States 1988–1992. National Cancer Institute, 1996: NIH Publication No. 96–4104.
9. Coughlin SS, Uhler RJ. Breast and cervical cancer screening practices among Asian and Pacific Islander women in the United States, 1994–1997. Cancer Epidemiol Biomarkers Prev 2000;9(6): 597–603. [PubMed: 10868695]
10. Saphir A Asian Americans and cancer: discarding the myth of the “model minority”. J Natl Cancer Inst 1997;89(2 l):1572–1574. [PubMed: 9362152]
11. Ward E, Jemal A, Cokinides V, Singh GK. Cancer disparities by race/ethnicity and socioeconomic status. CA Cancer J Clin 2004;54(2):78–93. [PubMed: 15061598]
12. Su X, Ma GX, Seals B. Breast cancer early detection among Chinese women in the Philadelphia area.. J Womens Health (Larchmt) 2006; 15(5):507–519. [PubMed: 16796478]
13. Tu SP, Yasui Y, Kuniyuki AA. Mammography screening among Chinese-American women. Cancer 2003;97(5): 1293–302. [PubMed: 12599238]
14. Kang SH, Chen AM, Lew R. Behavioral risk factor survey of Korean Americans, Alameda County, California, 1994. MMWR Morb Mortal Wkly Rep 1997:46:774–777. [PubMed: 9272585]
15. Lee EE, Fogg LF, Sadler GR. Factors of breast cancer screening among Korean immigrants in the United States. J Immiqr Minor Health 2006;8(3):223–233.
16. Kwong S, Chen M, Snipes K, et al. Asian subgroups and cancer incidence and mortality rates in California. Cancer 2005: 104(12): 2975–2981. [PubMed: 16247792]
17. Islam N, Kwon SC, Senie R, Kathuria N. Breast and cervical cancer screening among southeast Asian women in New York City. J Immigr Minor Health 2006;8(3):211–221. [PubMed: 16791531]
18. Ho V, Yamal JM, Atkinson EN. Predictors of breast and cervical screening in Vietnamese women in Harris County, Houston, Texas. Cancer Nurs 2005;(2):1 19–29, quiz 130–131.
19. Nguyen EV. Cancer in Asian American males: epidemiology, causes, prevention, and early detection Asian Am Pac Isl J Health 2003; 10(2):86–99. [PubMed: 15509149]
20. Ries LAG, Eisner MP, Kosary CL. SEER Cancer Statistics Review, 1973–1999 Bethesda, MD: National Cancer Institute 2002.
21. National Institutes of Health Consensus Program. Cervical Cancer NIH Consensus Statement, Bethesda: National Institutes of Health 1996; 14: 1–38. [PubMed: 9407932]
22. Department of Health and Human Services 2007. National Guideline Clearinghouse (online) Available at: http://www.guidelines.gov/browse/browsemode.aspx?node=7317&type=2&view=all. Accessed October 21, 2007.
23. Parikh SP, Brennan P, Boffetta P. Metaanalysis of social inequality and the risk of cervical cancer. Int J Cancer 2003;105(5):687–691. [PubMed: 12740919]
24. Singh GK, Miller BA, Hankey BF, Edwards BK. Persistent area socioeconomic disparities in U.S. incidence of cervical cancer, mortality, stage, and survival, 1975–2000. Cancer 2004: 101(5): 1051–1057. [PubMed: 15329915]
25. Hewitt M, Devesa SS, Breen N. Cervical cancer screening among U.S. women: analyses of the 2000 National Health Interview Survey. Prev Med 2004;39(2):270–278. [PubMed: 15226035]
26. New York City Department of Health and Mental Hygiene. NYC Vital Signs 2006;5(3): 1.
27. American Cancer Society. Screening and surveillance forth early detection of colorectal cancer and adenomatous polyps, 2008: a joint guideline from the American Cancer Society, the U.S. multi-society task force on colorectal cancer, and the American College of Radiology. CA Cancer J C/in 2008;58: 130–160.
28. Sabrina TW, Gildengorin G, Nguyen T. Disparities in colorectal cancer screening rates among Asian Americans and non-Latino Whites. Cancer 2005;104(12):2940–2947. [PubMed: 16276538]
29. Centers for Disease Control and Prevention. Trends in screening for colorectal cancerUnited States, 1997 and 1999. MMWR Morb Mortal Wkly Rep 2001;50(9):162–166. [PubMed: 11393486]

30. Ioannou GN, Chapko MK, Dominitz JA. Predictors of colorectal cancer screening participation in the United States. Am J Gastroenterol 2003 ;98(9): 2082–2091. [PubMed: 14499792]
31. American Liver Foundation. Hepatitis and Liver Disease in the United States (online) Available at: http://www.liverfoundation.org/db/articles/1008. Accessed July 7, 2005.
32. Centers for Disease Control and Prevention. Viral Hepatitis B: Fact Sheet (online) Available at: http://www.cdc.gov/ncidod/diseases/hepatitis/b/fact.htm. Accessed July 7, 2005.
33. Jenkins CN, Buu C, Berger W, Son DT. Liver carcinoma prevention among Asian Pacific Islanders: getting HBV shots into arms. Cancer 2001;91(1):252–56. [PubMed: 11148589]
34. Chen A HBV vaccination efforts among Asian Americans and Pacific Islanders. Asian Am Pac Isl J Health 1998;6(2):213–215. [PubMed: 11567432]
35. Do S The natural history of hepatitis B in Asian Americans. Asian Am Pac Isl J Health 2001;9(2): 141–153. [PubMed: 11846360]
36. James DC, Chen WW. A population-based HBV vaccination coverage survey among Asian and Pacific Islander American students in Alachua County, Florida. Asian Am Pac Isl J Health 2001;9(2):188–194. [PubMed: 11846364]
37. Burke NJ, Jackson JC, Thai HC. 'Honoring tradition, accepting new ways': development of a hepatitis B control intervention for Vietnamese immigrants. Ethn Health 2004;9(2): 153–169. [PubMed: 15223574]
38. Thompson MJ, Taylor VM, Jackson JC, et al. Hepatitis B knowledge and practices among Chinese American women in Seattle, Washington. J Cancer Educ 2002; 17(4):222–226. [PubMed: 12556060]
39. Taylor VM, Tu SP, Woodall E. Hepatitis B knowledge and practices among Chinese immigrants to the United States. Asian Pac J Cancer Prev 2006;7(2):313–317. [PubMed: 16839229]
40. Ma GX, Shive S, Tou bbeh J. Knowledge, attitudes, and behaviors of Chinese Hepatitis B screening and vaccination. Am J Health Behav 2008;32(2): 178–187. [PubMed: 18052858]
41. Taylor VM, Jackson JC, Chan N, Kuniyuki A. Hepatitis B knowledge and practices among Cambodian American women in Seattle, Washington. J Community Health 2002;27(3):151–163. [PubMed: 12027266]
42. Ma GX, Fang CY, Shive SE. Risk perceptions and barriers to hepatitis B screening and vaccination among Vietnamese immigrants. J Immigr Health 2007;(3):213–220.
43. Center for Disease Control and Prevention. 2006/2007 Prostate Cancer Initiatives Fact Sheet; 2007 Division of Cancer Prevention and Control.
44. American Cancer Society. Cancer Facts and Figures 2005 Atlanta, GA: American Cancer Society; 2006 Publication no. 5008.05.
45. American Cancer Society. Cancer Facts and Figures for African Americans 2005–2007 Atlanta, GA: American Cancer Society; 2007 Publication no. 8614.05.
46. Sim HG, Cheng CW. Changing demography of prostate cancer in Asia. Eur J Cancer 2005;4l (6): 834–45.
47. Park SK, Sakoda LC, Kang D. Rising prostate cancer rates in South Korea. Prostate 2006;66: 1285–1291. [PubMed: 16741923]
48. Sudman S, Bradburn NM. Asking Questions San Francisco: Jossey; 1986.
49. Faul F, Erdfelder E. GPOWER: A priori-, post hoc-, and compromise power analyses for MSDOS [computer program] Bonn, Germany: Bonn University; 1992.
50. Lipsey MW. Design Sensitivity: Statistical Power for Experimental Research Newbury Park: Sage Pu blications; 1990.
51. Parsa P, Kandiah M, Abdul R, Zulkefli NM. Barriers for breast cancer screening among Asian women: a mini literature review. Asian Pac J Cancer Prev 2006;7(4):509–514. [PubMed: 17250418]
52. Facione NC, Giancarlo C, Chan L. Perceived risk and help-seeking behavior for breast cancer. A Chinese-American perspective. Cancer Nurs 2000;23(4):258–267. [PubMed: 10939173]
53. Perez-Stable EJ, Napoles-Springer A, Miramontes JM. The effect of ethnicity and language on medical outcomes of patients with Hypertension or Diabetes. Med Care 1997;35:1212–1219. [PubMed: 9413309]

54. Baker OW, Parker RM, Williams MV, et al. Use and effectiveness of interpreters in an emergency department. JAMA 1996;275(10):783–788. [PubMed: 8598595]

55. Erzinger S Communication between Spanish-speaking patients and their doctors in medical encounters. Cult Med Psychiatry 1991; 15(1):91–110. [PubMed: 2060316]

56. Seijo R Language as a communication barrier in medical care for Latino patients. Hisp J Behav Sci 1991; 13:363.

57. Fang C, Ma GX, Tan Y, Nungia C. A multifaceted intervention to increase cervical cancer screening among underserved Korean women. Cancer, Epidemiol Biomarkers Prev 2007; 16(6): 1298–1302. [PubMed: 17548702]

Table 1

Frequencies of Demographic and Acculturation Factors in Relation to Ethnic Subgroup

Demographic Information	Chinese (n=925)	Vietnamese (n=362)	Korean (n=384)	Cambodian (n=340)	χ^2
Age					
18–39	23.68	17.13	32.81	8.53	
40–64	61.30	60.77	57.03	6765	
65+	15.03	22.10	10.16	23.82	85.4**
Years Lived in United States					
<6 yrs	21.75	16.02	24.68	971	
6 and <15 yrs	33.58	46.41	34.55	,1647	
≥15 yrs	44.67	37.57	40.78	4382	49.5**
Marital Status					
Married	75.60	74.24	70.94	73.67	
Not married	24.40	25.76	29.06	2633	3.1
Education Level					
No education or elementary school	12.20	2.82	1.64	52.13	
Below high school graduate	15.03	27.04	5.19	15.64	
High school	37.47	47.89	30.33	14.22	
University or higher	35.29	22.25	62.84	1801	529.1**
Employment Status					
Employed	65.50	61.39	64.14	58.75	
Unemployed	7.99	9.17	3.93	10.68	
Retired	12.99	13.61	5.50	3.26	
Homemaker	8.63	13.33	18.32	24.93	
Student	4.90	2.50	8.12	2.37	120.2**
Annual Household Income					
Less than $10,000	35.15	19.49	19.56	68.82	
10,000 – 20.000	33.02	40.44	17.67	17.49	
$20,001 – 30,000	10.41	22.43	26.81	6.08	
$30.00 I - 40.000	7.46	9.19	18.30	3.42	

Demographic Information	Chinese (n=925)	Vietnamese (n=362)	Korean (n=384)	Cambodian (n=340)	χ^2
Above $40,000	13.96	8.46	17.67	4.18	303.9**
Have Health Insurance					
No	31.72	17.17	53.00	55.72	
Yes	68.28	82.83	47.00	44.28	165.2**
Have a Regular Physician					
No	32.01	16.16	51.99	37.35	
Yes	67.99	83.84	48.01	62.65	108.9**
Language Physician Speaks With You					
English	16.67	21.18	23.46	75.72	
Native language	83.33	78.82	76.54	24.28	413.8**
Ability to Speak English					
Not at all	24.87	38.72	14.25	73.21	
Not well	45.86	44.57	55.15	16.96	
Well	20.15	14.48	23.75	8.33	
Very well	9.13	2.23	6.86	1.49	357.8**
Language Used to Watch TV/Movies					
English	20.88	16.62	36.60	5.01	
Native language	79.12	83.38	63.40	94.99	113.7**
Language Used to Read Newspaper					
English	8.91	10.36	10.47	2.09	
Native language	90.43	79.27	72.77	37.31	
Don’t read it	0.65	10.36	16.75	60.6O	687.1**
Often Use the Internet for Sources of Information					
No	62.67	61.58	26.30	80.85	
Yes	37.33	38.42	73.70	19.15	230.9**
Language Primarily Used for Information Search on Internet					
English	20.19	26.47	14.34	16.05	
Native language	79.81	73.53	85.66	83.95	9.5*
Number of Visits to Primary Physician in the Last 12 Months					

Demographic Information	Chinese (n=925)	Vietnamese (n=362)	Korean (n=384)	Cambodian (n=340)	χ^2
Never visited	23.51	26.48	49.74	43.40	
1–2 times	35.64	62.54	36.51	45.75	
3–4 times	23.72	6.76	9.26	7.92	
5 or more times	17.13	4.23	4.50	2.93	291.8**

*P<.05

**P<.0001

Am J Health Behav. Author manuscript; available in PMC 2019 July 12.

Table 2

Prevalence of Cancer Screening Among Asian American Subgroups

Cancer Screening	Total	Chinese (n=718)	Vietnamese (n=305)	Korean (n=289)	Cambodian (n=291)	χ^2
Breast Cancer-Mammogram[a]						
Never screened	33.6	20.10	28.36	30.23	78.52	
Noncompliance (>2yrs)	22.8	22.28	33.58	27.91	10.07	
Within 12 mo	43.6	57.63	38.06	41.86	11.41	187.5 *
Cervical Cancer-Pap Test[b]						
Never screened	37.7	27.95	33.33	35.71	75.61	
Noncompliance (>2yrs)	23.8	21.48	35.71	31.87	9.76	
Within 12 mo	38.6	50.57	30.95	32.42	14.63	160.2 *
Prostate Cancer[c]						
N ever screened	78.2	56.72	88.00	78.85	96.97	
Noncompliance (>2yrs)	7.5	17.91	1.00	5.77	1.0 I	
Within 12 mo	14.3	25.37	11.00	15.38	2.02	66.9 *
Liver Cancer-HBV[d]						
Never screened	71.4	62.12	79.67	67.82	89.35	
Screened	28.6	37.88	20.33	32.18	10.65	88.3 *
Colorectal Cancerd[e]						
Never screened	79.1	65.27	86.15	74.47	94.88	
Noncompliance (>2yrs)	7.9	14.15	3.08	8.5]	2.79	
Within 12 mo	13.0	20.58	10.77	17.02	2.33	78.7 *
Routine Health Exam[e]						
Never screened	11.8	9.18	13.24	34.69	5.19	
Noncompliance (>2)'rs)	32.0	19.64	15.98	14.29	75.76	
Within 12 mo	56.2	71.17	70.78	51.02	19.05	319.8 *

Note.

[a]For women 40+

[b] For women 18+

[c] For men 50+

[d] For men and women 18+

[e] For men and women 50+

Colorectal cancer screening refers to colonoscopy, fecal occult blood test (FOBT) or any CRC screening

[*] P<.0001