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English Language Proficiency and Smoking Prevalence among California's Asian Americans

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Abstract

The authors documented California's tobacco control initiatives for Asian Americans and the current tobacco use status among Asian subgroups and provide a discussion of the challenges ahead. The California Tobacco Control Program has employed a comprehensive approach to decrease tobacco use in Asian Americans, including ethnic-specific media campaigns, culturally competent interventions, and technical assistance and training networks. Surveillance of tobacco use among Asian Americans and the interpretation of the results have always been a challenge. Data from the 2001 The California Health Interview Survey (CHIS) were analyzed to provide smoking prevalence estimates for all Asian Americans and Asian-American subgroups, including Korean, Filipino, Japanese, South Asian, Chinese, and Vietnamese. Current smoking prevalence was analyzed by gender and by English proficiency level. Cigarette smoking prevalence among Asian males in general was almost three times of that among Asian females. Korean and Vietnamese males had higher cigarette smoking prevalence rates than males in other subgroups. Although Asian females in general had low smoking prevalence rates, significant differences were found among Asian subgroups, from 1.1% (Vietnamese) to 12.7% (Japanese). Asian men who had high English proficiency were less likely to be smokers than men with lower English proficiency. Asian women with high English proficiency were more likely to be smokers than women with lower English proficiency. Smoking prevalence rates among Asian Americans in California differed significantly on the basis of ethnicity, gender, and English proficiency. English proficiency seemed to have the effect of reducing smoking prevalence rates among Asian males but had just the opposite effect among Asian females.

Keywords

public health; epidemiology; cancer; statistics

Very few studies to determine smoking prevalence among Asian Americans have been conducted. Before 1990, a MEDLINE search using the key terms, “Asian American” and “tobacco” yielded only 10 citations. Most of these citations referred to school-based studies that involved very few Asian American students.[1] Beginning in 1990, Dr. Arthur Chen and Rod Lew of Asian Health Services in Oakland conducted the first behavioral risk factor smoking prevalence survey of a specific Asian-American ethnic group, Chinese Americans,

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[2,3] and, later, included Korean Americans in Alameda County.[4] At about the same time, Dr. Moon Chen and colleagues in Ohio initiated baseline smoking prevalence studies among Cambodians, Laotians, and Vietnamese; and Christopher Jenkins and colleagues in San Francisco conducted the first Vietnamese-specific smoking prevalence study in California.[5-7] These first "in-language" (i.e., in Cantonese, Korean, Khmer, Lao, and Vietnamese) studies provided much larger ethnically specific sample sizes than some English-only surveys and revealed smoking prevalence rates among male Asian Americans by ethnicity that were higher than those derived from English-only population-based surveys.[1-7] In-language surveys also have yielded higher response rates, e.g., 69% for a smoking-related study among Chinese Americans in New York[8] and 88% among Southeast Asians.[9] Because it is home to approximately 35% of all Asian Americans in the United States, California represents a fertile state for ethnic-specific data on tobacco use. In 2000, nearly 3.7 million Asian Americans resided in California, constituting 11% of the population.

The California Tobacco Control Program

In 1989, state legislation structured the nation's first state-based public health program, the California Tobacco Control Program (CTCP), supported by excise tax revenues that resulted from a ballot initiative (Proposition 99).[10,11]

In late 1989, the California Department of Health Services, Tobacco Control Section (TCS) was established and officially was launched in April, 1990 to deliver the CTCP. From the offset and up to the current day, TCS has used the "denormalization" of tobacco use as its principal strategy. Specifically, TCS chose to 1) counter protobacco influences in the community, 2) reduce the exposure to second-hand smoke, 3) reduce the availability of tobacco to youth, and 4) support cessation efforts.[12,13]

The decline in smoking in California has been documented through decreases in cigarette consumption[13,14] as much as 52% faster in California compared with the rest of the United States,[15] reductions in mortality rates due to heart disease,[16] and reductions in exposure to second-hand smoke.[17] Lung cancer rates in California have declined at a faster rate than in other parts of the United States.[18,19]

CTCP's Health Promotion Efforts among Asian-American Communities

From the start of the program, given the diverse demographics of California, TCS recognized the need to create a comprehensive, multifaceted program that addressed health disparities of those Californians who were affected most by tobacco use or exposure to second-hand smoke. Therefore, TCS funded advertising and public relations agencies that not only reached California's general but also included in-language campaigns for the Asian and Pacific Islander (API) populations.

TCS funds the only comprehensive Asian-specific media campaign in the nation. The Centers for Disease Control and many other states utilize TCS ads for their own API populations. TCS has made more than 25 television and radio ads in a variety of languages, including Korean, Vietnamese, Cantonese, Mandarin, Hmong, and Laotian, to educate the community about the dangers of exposure to second-hand smoke, to expose the tobacco industry's targeted campaign, and to promote tobacco cessation. TCS also has produced numerous print and outdoor ads in Korean, Vietnamese, Chinese, Tagalog, Laotian, Cambodian, Thai, and Japanese. TCS public-relations efforts include in-language press releases and press conferences, training members of the community members to be spokes-persons, submitting letters to the editor to news and print outlets, and writing Op Ed pieces.

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There is published evidence that culturally sensitive and relevant educational approaches can change tobbaco-use behavior among Asian-American populations.[20,21] Because TCS recognized the need to develop culturally competent programs and interventions, a concerted effort was made to fund community-based agencies that had access to and effectively could reach California's diverse ethnic populations. In July 1990, more than 150 competitive grants were funded, and approximately 22 of those grants targeted the API community. TCS sought to fund agencies to develop culturally sensitive and relevant educational materials to change their populations' tobacco-use behavior. The ultimate objective of TCS was to create the leadership that would mobilize and motivate communities to advocate for policies to protect themselves from the unscrupulous targeting by the tobacco industry and decrease tobacco use and exposure to second-hand smoke. Throughout the last 14 years, TCS consistently has funded agencies that focus directly on the API community. Examples of interventions that were funded include the creation of in-language educational materials, videos, and advocacy campaigns targeting the Laotian, Chinese, Korean, Cambodian, Hmong, Thai, Vietnamese, and South Asian populations focusing on the negative health effects of smoking, exposure to second-hand smoke, and countering the tobacco industry's presence through advertising, marketing, and sponsorship in their communities.

TCS also has funded a number of training and technical assistance contractors to assist TCS in tobacco-control efforts targeting ethnic populations. In 1991, TCS funded four ethnic networks that included API populations. The networks helped build the capacity of local community-based organizations to work in tobacco control, to assess and coordinate the cultural appropriateness of health education materials, and to provide technical assistance and training to enhance local health departments' ability to work with ethnic populations. Other technical assistance and support activities for the API community included a materials clearinghouse that cataloged and made available peer-reviewed and approved in-language education materials targeting many API populations and a toll-free telephone tobacco quit line in Vietnamese, Mandarin, Cantonese, and Korean.

Surveillance of Tobacco Use among Asian Americans

CTCP employed a comprehensive approach to assess tobacco use among Californians, including APIs, as one of the indicators to evaluate the overall effect of the program. More than one data source was available to analyze the tobacco use among APIs in California. These sources included the California Tobacco Survey (CTS), California Adult Tobacco Survey (CATS) and Behavioral Risk Factor Survey (BRFS), and the California Health Interview Survey (CHIS). In the current study, we chose to use CHIS for the following reasons:

The California Tobacco Survey (CTS) is a large-scale, population-based tobacco-use survey that is conducted every 3 years by the University of California–San Diego for the CTCP. First operational in 1990, the survey includes a screener questionnaire, which collects some basic tobacco-use information; an extensive adult questionnaire; and a youth questionnaire. Because of its large sample size, especially in the screener survey, smoking prevalence rates and trends among the Asian population in general and in some subpopulations can be obtained from the CTS. However, the interviews were conducted in English and Spanish only. Hence, we did not choose to use the CTS as our data base for this report.

The CATS and BRFS have been conducted annually by the California Department of Health Services, Cancer Surveillance Section, and CTCP. Because of their limited sample size, these instruments are not the ideal source for exploring detailed tobacco-use behavior among Asian Americans, and especially among Asian subpopulations. Again, these two surveys use English and Spanish only.

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The CHIS has been conducted every other year since 2001 by the Center for Health Policy Research at the University of California–Los Angeles. It is a comprehensive health survey of a large population base with supplemental samples for some ethnic groups, including a number of Asian subpopulations. The CHIS was chosen as our data base because of its large sample size of six specific Asian groups and the finding that the CHIS was conducted routinely in Asian languages.

MATERIALS AND METHODS

Survey and Sample

The 2001 CHIS interviewed adults, adolescents. and the parents or guardians of children in 55,428 California households. A random-digit-dialed (RDD) telephone sampling frame, which represented 58 counties and 3 cities with local health departments, was used to obtain the sample. Detailed sampling methodology is described elsewhere.[22] One randomly selected adult (age 18 yrs or older) from each household completed the adult survey (n = 55,428 respondents). The screener cooperation rate (the percentage of individuals contacted successfully) was 59.2%, and the extended interview completion rate was 63.7% of the successfully screened sample.[23]

To capture the rich diversity of the California population, CHIS 2001 used 2 strategies to assure adequate sample sizes for race/ethnic groups, including some Asian populations. First, a sufficient sample was allocated to the larger counties in which the majority of Asian populations resided to generate adequate RDD samples for major Asian subpopulations. Second, supplemental samples were designed to improve the sample size and precision of the estimates for specific ethnic groups. The lists for the supplemental samples were created by using records of surnames from each of the Asian groups for California. Simple random samples were then drawn from the surname lists. The RDD sampling generated large enough sample sizes for both Chinese and Filipino populations. Most samples of other Asian subpopulations were obtained from the surname list frame. RDD samples and list samples were combined and weighted as a single sample. The weighting process incorporated the probability of selecting the telephone numbers from the RDD and list sampling frames.[24] Interviews were conducted in six languages: English, Spanish, Chinese (Mandarin and Cantonese dialects), Vietnamese, Korean, and Khmer (Cambodian).[22]

For the current report, we analyzed the prevalence of smoking among Asian Americans in general and among six Asian subpopulations in California. The main objectives of these analyses were to identify differences and similarities among major Asian subpopulations and to identify important factors associated with tobacco use in Asian Americans. “Acculturation” has been identified as a principal influence on smoking rates among Asian Americans; however, to date, there has been no consensus on defining acculturation.[9] We anticipated that English proficiency level would play an important role in Asian American's tobacco-use behavior, and the selection of language (English or an Asian language) is of great programmatic value in determining which intervention measures are used.

Measures

Current smoking—Standard questions were used to assess respondents' cigarette smoking status. Respondents were asked, “Have you smoked at least 100 cigarettes in your entire life?” and “Do you now smoke cigarettes every day, some days, or not at all?” Current smokers were defined as individuals who reported having smoked ≥ 100 cigarettes during their lifetimes and who currently smoked every day or on some days.

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Demographic characteristics—Demographic variables, including age, education, and household income, were used in the analysis. The sample was categorized into groups ages 18–24 years, 25–34 years, 35– 44 years, and 45 years or older; education level (highest grade/degree achieved) was reclassified as high school graduate or lower, some college, and college graduate or higher; household income (in $5000 intervals) was recategorized as ≤ $30,000, $30,001-80,000, and > $80,000.

English proficiency—In the CHIS, respondents were asked: "What language do you speak at home?" Respondents who reported speaking non-English languages (including bilingual and other languages only) were then asked, "Would you say you speak English very well, well, not well, or not at all?" From these two questions, respondents who spoke English only at home *or* who spoke English "very well" were classified into the group with high English proficiency. Others were classified into the group with relatively low English proficiency. This arbitrary categorization provided a relatively balanced sample for each level.

Data Analysis

Taking the probability of household selection and individual selection into consideration, CHIS data were weighted to Census 2000 California population estimates.[24] Descriptive analyses on Asians' and Asian sub-populations' demographic characteristics, English proficiency, and smoking prevalence were conducted using SAS 8.2 PROC FREQ (on unweighted data) and SAS-callable SUDAAN PROC DESCRIPTIVE (on weighted data) procedures, respectively (SAS Institute Inc., Cary, NC).[25,26] We constructed a multiple logistic regression model to examine whether self-reported English proficiency was associated with cigarette smoking among Asians in general after controlling for demographic characteristics, including country of origin. Based on the results from descriptive analyses, we included an interaction term of English proficiency and gender in the model. This analysis was conducted by using the SUDAAN PROC RLOGISTIC procedure with weighted data.[26]

RESULTS

Demographic Characteristics

The overall Asian sample in the CHIS included 5822 respondents. The Chinese and Filipino populations had sample sizes of 1282 and 923, respectively, and all other Asian subpopulations had sample sizes of approximately 800 (Table 1). The Japanese and Vietnamese populations had higher percentages of respondents in the group age 45 years or older compared with other Asian subpopulations (Table 1).

The majority of Vietnamese respondents (62.5%) reported a household income ≤ $30,000. Conversely, almost one-half of South-Asian respondents (48.5%) reported a household income > $80,000. Similar patterns were found for education levels. Approximately 80% of South-Asian respondents (81.0%) had a college degree or higher, whereas nearly 60% of Vietnamese respondents (59.1%) had a high school graduate degree or lower (Table 1).

According to our arbitrary definition, approximately 50% of respondents were classified with relatively "high" English proficiency. Filipinos, South Asians, and Japanese had a higher percentage of respondents with relatively high English proficiency. Koreans, Vietnamese, and Chinese had a higher percentage of respondents with low English proficiency (Table 1).

Cigarette Smoking Prevalence among Asian Subpopulations

The overall smoking prevalence among Asian Americans in California was 13.8% (95% confidence interval [95% CI], 12.4 –15.2%) (Table 2), similar to the results reported from other surveys.[27,28] Cigarette smoking prevalence among Asian males in general was significantly

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higher (almost three times) than that of Asian females. Korean males and Vietnamese males (35.9% [95% CI, 29.2–42.6%] and 31.6% [95% CI, 25.7–37.5%], respectively) had higher cigarette smoking prevalence compared with males in other Asian-American sub-populations and in Californian men in general from the same survey (20.0%; 95% CI, 19.2–20.7%).[26] Although Asian females were much less likely to smoke compared with Californian women in general (7.3% [95% CI, 6.0–8.6%] vs. 14.1% [95% CI, 13.1–15.1%]),[29] there were significant differences between Asian-American subpopulations, ranging from 1.1% (Vietnamese women) to 12.7% (Japanese women).

The Impact of English Proficiency on Cigarette Smoking Prevalence

Overall, there was no significant difference in the prevalence of cigarette smoking between Asian Americans with high English proficiency or low English proficiency (Table 2). However, after analyzing the sample according to gender, we observed different patterns of smoking prevalence for the two English proficiency levels. Among Asian males, those with high English proficiency had significantly lower smoking prevalence. The pattern was completely opposite for Asian women. Asian women with high English proficiency were significantly more likely to smoke than Asian women with lower English proficiency.

Most subpopulations had a pattern similar to that of Asian Americans in general, except that Korean and Japanese women had similar smoking prevalence across English proficiency levels. In addition, confidence intervals of smoking prevalence were wide after analyzing the data according to gender and English proficiency level, which caused difficulty with using confidence intervals to estimate and/or test significance.

Logistic regression analysis showed that the interaction term that included English proficiency level and gender had a negative, statistically significant β coefficient after controlling for household income, education level, and country of origin (Table 3). The results indicate that there is a significantly different pattern across English proficiency levels between Asian men and women regarding cigarette use. In this analysis, Asian men who had high English proficiency were less likely to be smokers than those Asian men lower English proficiency. Asian women with high English proficiency were more likely to be smokers than Asian women with lower English proficiency. This was a generic trend among Asian Americans and was independent of their country of origin.

DISCUSSION

The results from this study show that the smoking prevalence rates among Asian Americans in California differ significantly on the basis of ethnicity, gender, and English proficiency. Prior surveys have documented ethnic differences among Asian-American subpopulations[30,31] and by gender.[30,32] English language use also was linked to the smoking status among Asian-American males and the risk of experimentation with smoking among adolescents.[3,7,20,21,33] To our knowledge, this is the first study to document an interaction between English proficiency and gender in differentiating smoking status among Asian-American adults by the time this paper was written.

When ethnicity was analyzed as a separate variable, the 2001 CHIS data indicated that Korean and Vietnamese had overall higher smoking prevalence rates compared with the overall Asian-American rate and the overall Californian rate. In addition, Chinese and South Asians in general had smoking prevalence rates lower than the overall Asian-American rate and the overall Californian rate. Both cultural influences and socioeconomic status may contribute to the differences. That implies that a “cookie-cutter” type of intervention strategy for “pan-Asians” cannot be effective.[34]

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When gender was analyzed as a separate variable, the lower smoking prevalence rates among Asian-American females, compared with Asian-American males, are conspicuous. Smoking prevalence rates < 10% for Asian-American females have been cited typically based on self-reported data. However, based on biochemical verification, the differences between self-reported smoking rates and objectively verified rates have been statistically significant among both men and women, with a much greater discrepancy among women.[35] Therefore, future studies may need to incorporate biochemical measures.

When analyzing ethnicity, gender, and English proficiency together, the results may be viewed in two ways. First, English proficiency varied between Asian-American subpopulations. Korean and Vietnamese are more likely to be non-English speakers, whereas South Asians and Japanese have higher English proficiency. English proficiency levels are more balanced among Californians who belong to the two largest Asian sub-populations: Chinese and Filipino. These results suggest that language-specific interventions or services are important to most Asian subpopulations. However, language may not be the most appropriate indicator of acculturation for all subpopulations. For example, many South Asians speak English even in their native countries. For them, proficiency in English does not translate into a higher level of acculturation.

Second, the impact of English proficiency on cigarette use depends on gender. Among Asian-American men, higher English proficiency was related to lower smoking prevalence. An opposite pattern was observed among Asian-American women. This result seems to confound the search for the best intervention strategies. Based on our findings, more acculturated women, who were identified operationally as more proficient in English, were more likely to smoke. Thus, is it likely that, as more Asian-American women become more proficient in English, they will be more susceptible to adopting smoking? Denormalizing tobacco use has been the strategy for CTCP and has had a positive impact on Californians in general regarding tobacco-use behavior; however, it seems that higher English proficiency among Asian-American females offsets this positive impact to some extent. Strengthening the denormalizing effort for Asian-American females and possibly for other females as they acculturate may be one of the next challenges for CTCP. The design and delivery of health education messages about smoking to Asians must take gender and language use into consideration.

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TABLE 1

Demographic Characteristics by Ethnic Background, 2001 California Health Insurance Survey: Unweighted Data

Variable	Overall (*n* = 5822)	Korean (*n* = 791)	Filipino (*n* = 923)	South Asian (*n* = 820)	Japanese (*n* = 797)	Chinese (*n* = 1282)	Vietnamese (*n* = 843)
Gender							
Male	44.6	39.8	38.2	55.9	46.3	39.9	50.5
Female	55.4	60.2	61.8	44.1	53.7	60.1	49.5
Age							
18–24 yrs	9.7	9.4	11.0	8.9	6.3	11.2	7.5
25–34 yrs	22.3	26.3	20.5	37.6	13.3	19.0	18.5
35–44 yrs	25.3	24.5	25.5	27.2	21.6	27.5	23.4
≥ 45 yrs	42.7	39.8	43.0	26.5	58.9	42.4	50.7
Income							
≤ $30,000	34.5	36.0	30.1	13.3	22.7	34.6	62.5
$30,001–$80,000	37.9	40.3	47.0	38.2	43.1	35.1	26.1
≥ $80,001	27.6	23.6	22.9	48.5	34.1	30.3	11.4
Education							
≤ High school	30.1	29.0	25.6	8.4	20.3	28.4	59.1
Some college	19.9	14.9	26.3	10.6	27.5	20.4	17.6
≥ College	50.1	56.1	48.1	81.0	52.2	51.2	23.4
English proficiency							
High	52.0	25.2	66.5	69.8	79.3	40.8	9.5
Low	48.0	74.8	33.5	30.2	20.7	59.2	90.5

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TABLE 2

Smoking Prevalence by Ethnic Background and by English Proficiency, 2001 California Health Insurance Survey Weighted Data

Variable	Overall (*n* = 5447) % (SE)	Korean (*n* = 788) % (SE)	Filipino (*n* = 923) % (SE)	South Asian (*n* = 820) % (SE)	Japanese (*n* = 797) % (SE)	Chinese (*n* = 1282) % (SE)	Vietnamese (*n* = 843) % (SE)
Overall	13.8 (1.4)	20.8 (3.4)	16.8 (3.4)	8.8 (2.9)	12.9 (3.3)	9.7 (1.9)	16.3 (3.1)
Male	21.2 (2.4)	35.9 (6.7)	24.4 (6.5)	13.8 (4.8)	13.2 (4.5)	14.5 (3.2)	31.6 (5.9)
Female	7.3 (1.3)	9.0 (3.6)	10.5 (2.7)	2.6 (2.2)	12.7 (4.6)	6.1 (2.3)	1.1 (0.9)
English proficiency							
High							
Male	17.3 (3.2)	23.9 (11.5)	26.8 (8.4)	13.4 (5.8)	9.3 (3.7)	9.0 (5.0)	25.7 (15.3)
Female	10.8 (2.3)	11.0 (9.7)	13.2 (3.7)	3.5 (3.3)	12.6 (5.0)	10.5 (5.3)	1.8 (3.6)
Low							
Male	24.9 (3.2)	39.4 (7.7)	19.5 (9.3)	14.8 (8.6)	30.4 (13.3)	17.9 (4.8)	32.7 (6.4)
Female	4.3 (1.2)	8.4 (3.6)	5.4 (3.8)	1.0 (1.2)	13.0 (8.1)	3.3 (1.6)	1.0 (0.9)

SE: standard error.

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TABLE 3

Logistic Regression Results of Current Cigarette Smoking

Variable	β Coefficient	*P* value
English proficiency		
High	1.23	0.0000
Low	Reference:	NA
Gender		
Male	2.19	0.0000
Female	Reference	NA
Age group		
18–24 yrs	0.22	0.2963
25–34 yrs	1.05	0.0000
35–44 yrs	0.61	0.0001
≥ 45 yrs	Reference	NA
Household income		
≤$30,000	0.29	0.1114
$30,001–$80,000	0.06	0.6973
≥ $80,001	Reference	NA
Education		
≤ High school	0.77	0.0000
Some college	0.40	0.0151
≥ College	Reference	NA
Asian subpopulation		
Vietnamese	0.30	0.0830
Filipino	0.57	0.0011
South Asian	− 0.19	0.3643
Japanese	0.41	0.0709
Korean	1.04	0.0000
Chinese	Reference	NA
English proficiency		
High male	− 1.57	0.0000
High female	Reference	NA

NA: not applicable.