

Relationships between Household Smoking Restrictions and Intention to Quit Smoking among Korean American Male Smokers in California

This cross-sectional study examined the relationships between household smoking restrictions and intentions to quit smoking among Korean American male smokers in California. We used data from the California Korean American Tobacco Use Survey (CKATUS), which was conducted in 2004 using computer-assisted telephone interviewing. Among the 2,545 respondents who participated in the CKATUS, the 387 male smokers who answered a question assessing their intention to quit smoking were included in the final analyses. In univariable analyses, smokers who reported having household smoking restrictions were more likely to intend to quit smoking as compared with those who did not ($P < 0.01$). Other independent correlates of having an intention to quit smoking were being less than 50 yr of age, having spent more than 50% of one's life in the US, being assimilated, and having other smokers in the household. In a multiple logistic regression analysis, the significant correlates of having an intention to quit smoking were household smoking restrictions (complete or partial restriction vs. no restriction on smoking; odds ratio, 2.54; 95% confidence interval, 1.22-5.28) and absence of other smokers in the household. In conclusion, smoking restrictions in the household are associated with an intention to quit smoking among Korean American male smokers in California.

Key Words : Smoking; Family Characteristics; Intention; Korean Americans

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Seung-Kwon Myung^{1,2}, Diana D. McDonnell²,
Gene Kazinets², Hong Gwan Seo¹,
and Joel M. Moskowitz²

Smoking Cessation Clinic¹, Center for Cancer Prevention and Detection, National Cancer Center & Division of Cancer Prevention, National Cancer Control Research Institute, National Cancer Center, Goyang, Korea; Center for Family and Community Health², School of Public Health, University of California, Berkeley, Berkeley, USA

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Address for Correspondence

Joel M. Moskowitz, Ph.D.
Center for Family and Community Health, School of Public Health, University of California at Berkeley, 50 University Hall, Berkeley, California 94720-7360, USA
Tel : +1.510-643-7314, Fax : +1.510-643-7316
E-mail : jmm@berkeley.edu

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INTRODUCTION

As secondhand smoke has been found to be a health risk to non-smokers, household smoking bans as well workplace smoking bans have become common in the United States. The prevalence of household smoking bans has increased from 43% in 1993 to 61% in 1999 (1). Concerning household smoking bans, a variety of topics such as secondhand smoke, childhood asthma, health status, and tobacco use behavior have been examined (2-6). Further, several studies have reported the relationship between household smoking bans and intention to quit smoking or actual smoking cessation. A prospective study found that a complete household ban at baseline was associated with twice the odds of a subsequent quit attempt (7). An international panel survey also reported that intention to quit at baseline was associated with implementing household bans between baseline and follow-

up, an average of seven months later (8).

According to the 2005 California Health Interview Survey (CHIS), 31% of Korean American (KA) men were current smokers (9). This rate is higher than current smoking among other Asian American men (18%) or the average of all men in California (19%) (9).

Given this higher smoking rate among KA men, household smoking restrictions could be of particular relevance to this community. The aim of this study was to estimate the prevalence of household smoking restrictions and to examine the relationship between them and the intention to quit smoking among KA male smokers in California, using data from the California Korean American Tobacco Use Survey (CKATUS), which was conducted to identify tobacco use behavior among adults of Korean descent residing in California (Korean Californians) (10).

MATERIALS AND METHODS

The CKATUS was conducted between 2003 and 2004 to assess tobacco knowledge, attitudes, and behavior among 2,545 adults of Korean descent residing in California, using computer-assisted telephone interviewing (CATI) (10). The survey was sponsored by the Tobacco Control Section, California Department of Health Services, USA.

Methodology of the CKATUS

The methodology for this survey has been presented elsewhere (9). The sample was obtained from a list of telephone numbers registered to individuals with Korean surnames residing in California. To ensure a representative sample, the original sample was stratified based on generation, region, and gender.

The sample was modified to reflect gender proportions by region only, because the number of second generation Koreans residing in California was too small to locate enough individuals to achieve the original sampling design. To compensate for selection bias (which is the unequal probability of one person being selected into the sample over another person), and provide representative population estimates, we used a weighting technique. Data were weighted by number of adults per household, number of residential telephone lines, and region to represent the population characteristics of KAs in California.

The survey included questions from the California Tobacco Survey (CTS) (10), as well as additional items specific to this population, including a measure of acculturation. The CTS assesses cigarette smoking behavior and other tobacco use, attitudes toward smoking, and media exposure to smoking and health-related information. Interviews were conducted in English and Korean by Strategic Research Group (SRG, Columbus, OH, USA). The overall response rate for the survey was 48%.

Methodology of this study

We used the CKATUS data for the current study and received an exemption from the Institutional Review Board at the University of California, Berkeley because these data are publicly available and individual data are not identifiable.

Samples

Among the 2,545 total respondents (i.e., men and women) who participated in the CKATUS, 15.3% were current smokers. Of the current smokers, 387 adult men were included in the final analysis based on smoking at least 100 cigarettes in their lifetime, smoking everyday or some days at the time of the interview, and having responded to a question about their quitting intentions.

Measures

We evaluated participants' intention to quit smoking with the question, "What best describes your intentions regarding quitting? Would you say you...," "Are planning to quit in the next 30 days," "Contemplating quitting in the next 6 months," "May quit in the future, but not in the next 6 months," or "Never expect to quit." For the analysis, this was coded as a binary variable: any of the first three response categories was defined as having an "intention to quit," and the last response category was defined as "not having an intention to quit."

Household smoking restrictions were evaluated with the question, "What are the smoking rules or restrictions in your household, if any?" The four possible responses were, "Smoking is completely prohibited," "Smoking is generally banned for everyone with few exceptions," "Smoking is allowed in some rooms only," or "There is no restriction on smoking." This was coded as a binary variable: the first three response categories were defined as having "complete or partial ban on smoking," and the last response category was defined as "no restrictions on smoking."

Acculturation can be broadly defined as the cultural modification of an individual, group, or people by adapting to, or borrowing, traits from another culture (11). In the CKATUS it was defined as the process by which a subculture is absorbed into the dominant culture. Based on this operationalization, language proficiency is likely to be an appropriate indicator. Therefore, in the CKATUS, acculturation was defined using questions about language proficiency. Categories included traditional (not acculturated), bilingual (somewhat acculturated), or assimilated (acculturated). Respondents who spoke both English and Korean at least "pretty well" were categorized as bilingual and, therefore, somewhat acculturated. Those who only spoke Korean were categorized as traditional or not acculturated, and those who spoke only English were categorized as assimilated or acculturated.

Statistical analyses

We used weighted data to compensate for non-response bias and to provide representative population estimates. A Pearson chi-square test for categorical variables and a two-sample t-test for continuous variables were used in the univariable analyses to evaluate the association between smoking restrictions (complete or partial restriction vs. no restriction on smoking) or sociodemographic variables and intention to quit. We also conducted a multiple logistic regression to adjust for potential confounding including age (>45 yr vs. 18-44 yr), annual household income (>US\$ 50,000 vs. ≤US\$ 50,000), education (≥college graduate vs. <college graduate), proportion of life spent in the US (>50% vs. ≤50%), and number of smokers in the household (1 vs. 0, 2 or more vs. 0). Considering the multicollinearity among proportion of life spent in the US, generation, and acculturation, only the variable of proportion of life spent in the US,

which was considered to be more objective and significant, were included in the final model. Odds ratios (OR) and 95% confidence intervals (CIs) were calculated using Stata SE 10.0 svy commands to adjust standard errors for the complex survey sample design (StataCorp, College Station, TX, USA). All statistical tests were two-sided, and we considered $P < 0.05$ to be statistically significant.

RESULTS

Sample characteristics

Table 1 summarizes the characteristics of the adult male smokers included in the final analyses. About 60% had at least a college education. Most were first generation KAs (89.7%), and about 10% were assimilated. Almost 25% had spent more than half of their lives in the US.

Table 1. Sample characteristics and comparison by intention to quit*(n=387)

Characteristics	Participants without intention to quit (n=64); row %	Participants with intention to quit (n=323); row %	P	Frequencies (Unweighted)	% (Weighted)
Age (yr)			0.02		
18-29	21.6	78.4		102	25.8
30-39	11.1	88.9		95	22.8
40-49	15.0	85.0		97	25.0
≥50	30.9	69.1		86	26.3
Marital status			0.61		
Married or unmarried couple	20.8	79.2		234	64.9
Not married	18.1	81.9		151	35.1
Annual household income (US\$)			0.05		
≤US\$ 50,000	25.1	74.9		168	44.8
>US\$ 50,000	15.2	84.8		172	43.8
Education level			0.06		
<College graduate	25.8	74.2		148	40
≥College graduate	16.2	83.8		232	60
Generation			0.06		
First generation	21.1	78.9		319	89.7
Second generation	7.9	92.1		68	10.3
Proportion of life spent in the US (%)			0.03		
≤50%	23.0	77.0		255	75.1
>50%	11.7	88.3		122	24.9
Acculturation			0.01		
Assimilated	6.6	93.4		62	10.1
Bilingual or traditional	21.2	78.8		325	89.9
Number of cigarettes smoked per day [†]			0.42		
1-10	20.5	79.5		150	50.8
11-20	18.4	81.6		133	43.6
>20	34.6	65.4		15	5.6
Smoking ban in the household			<0.01		
No restriction on smoking	33.5	66.5		73	17.4
Restriction (complete or partial) on smoking	17.6	82.4		294	82.6
Number of other household members who are smokers			<0.01		
0	15.0	85.1		220	52.0
1	18.6	81.4		127	34.4
2 or more	40.8	59.2		40	13.6
Intention to quit smoking					
Plan to quit in the next 30 days	NA	NA		71	16.7
Contemplate quitting in the next 6 months	NA	NA		91	22.5
May quit in the future, but not in the next 6 months	NA	NA		161	41.0
Never expect to quit	NA	NA		64	19.8

*Participants were adult men current smokers among the 2,545 respondents in the California Korean American Tobacco Use Survey; [†]The relationship between this variable and 'intention to quit' variable was evaluated for only 298 subjects due to missing data. Percentages (%) and P values were calculated from analyses of complex survey design.

Forty-one percent reported that they might quit smoking in the future, but not in the next 6 months, while 19.8% never expected to quit. Regarding smoking restrictions, 17.4% had households with no restriction on smoking, while 82.6% lived in households where smoking was completely or partially prohibited (40.2% and 42.4%, respectively; data not shown in Table 1). Almost half (48%) lived with other smokers.

Comparison of characteristics by intention to quit

Table 1 compares characteristics of respondents who had no intention to quit smoking with those who did. Compared with those who had no intention to quit, those who intended to quit smoking were significantly more likely to be younger than 50 yr ($P=0.02$), have spent more than 50% of their lives in the US ($P=0.03$), be assimilated ($P=0.01$), have restrictions on smoking in their household ($P<0.01$), and have other household members who smoked ($P<0.01$). Higher annual household income ($P=0.05$), higher education level ($P=0.06$), and second generation ($P=0.06$) had marginally significant associations with intentions to quit smoking.

Independent correlates of having an intention to quit smoking

As shown in Table 2, the significant independent corre-

Table 2. Independent correlates of having an intention to quit smoking from the multiple logistic regression analysis (n=387)*

Variables	OR (95% CI)*
Smoking restrictions in the household	
No restriction on smoking	1
Restriction (complete or partial) on smoking	2.54 (1.22 to 5.28)
Number of other household members currently smoking	
0	1
1	0.69 (0.34 to 1.43)
2 or more	0.19 (0.08 to 0.49)
Education level	
<College graduate	1
≥College graduate	1.93 (0.98 to 3.82)
Age (yr)	
18-44	1
>45	0.50 (0.25 to 1.00)
Annual household income	
≤US\$ 50,000	1
>US\$ 50,000	1.25 (0.61 to 2.57)
Proportion of life spent in the US	
≤50%	1
>50%	2.37 (0.89 to 6.31)

*OR and 95%CI were calculated from analyses of complex survey design and were adjusted for age, annual income, education, proportion of life spent in the US, smoking restrictions in the household, and number of smokers in the household, using weighted data. OR, odds ratio; CI, confidence interval.

lates of having an intention to quit smoking in the multiple logistic regression analysis were household smoking restrictions (complete or partial restriction vs. no restriction on smoking; OR, 2.54; 95% CI, 1.22-5.28) and absence of other smokers in the household (2 or more vs. no other smokers in the household; OR, 0.19; 95% CI, 0.08-0.49). Higher education (≥college graduate vs. <college graduate; OR, 1.93; 95% CI, 0.98-3.82) and younger age (>45 yr vs. 18-44 yr; OR, 0.50; 95% CI, 0.25-1.00) had marginally significant associations with intention to quit smoking.

DISCUSSION

In this cross-sectional survey of KA adult male smokers in California, we found that household smoking restrictions were associated with having an intention to quit smoking. This finding is similar to those of previous studies (7, 8, 12). A prospective study reported that a complete ban at baseline, compared with no ban or a partial ban, was significantly associated with an increase in subsequent quit attempts (OR, 2.0) (7). The International Tobacco Control (ITC) Four Country Survey—a cohort study conducted in 2002 with an average of seven months follow-up—reported that intentions to quit at baseline were associated with implementing bans between baseline and follow-up (8). Bans at baseline were also associated with more quit attempts and success at follow-up (8). Another longitudinal study showed that smokers in the preparation stage (i.e., planning to quit seriously within the next 30 days and having made at least one-day quit attempt in the past year) were more likely to adopt a full ban than those either in precontemplation (having no intention to quit within the next 6 month) or contemplation (considering quitting seriously within the next 6 months) stages (12).

We also found that those who lived with 2 or more other smokers were less likely to intend to quit smoking, and those who were more educated were more likely to intend to quit smoking. Other significant factors associated with an intention to quit from univariable analyses included age and proportion of life spent in the US. Also, higher education and younger age had marginally significant associations with intentions to quit smoking. Several previous studies have reported that the intention to quit smoking was more prevalent among those who were younger, had higher income, and smoked fewer cigarettes per day (13-15). Our findings were consistent with earlier studies except for daily cigarette consumption, which may be due to missing data on this variable in the CKATUS.

Smokers who were linguistically assimilated and spent more than half of their life in the US were more likely to have an intention to quit smoking. These findings may be due to different social norms about smoking in the US and their country of origin (in this case, Korea). According to the Organisation for Economic Cooperation and Development

(OECD) 2001 Health Data, current smoking prevalence of adult men in Korea (52.9%) was much higher than in the US (20.3%) (16). The low smoking prevalence in the US may, therefore, facilitate intentions to quit smoking, especially among more assimilated men.

Also, we performed univariable analyses and a multiple logistic regression analysis based on a different operationalization for the outcome variable (i.e., intention to quit in the next 6 months—stages of contemplation and preparation vs. no intention to quit in the next 6 months—stage of precontemplation). However, there was no significant association between household smoking restrictions and having an intention to quit smoking ($P=0.40$). Therefore, in the current study, we could conclude that those who had household smoking restrictions were significantly more likely to have an intention to quit smoking (vs. never expect to quit smoking), even though they were not likely to contemplate quitting in the near future (i.e., in the next 6 months).

Our study had several limitations. First, due to the cross-sectional nature of the survey, we are unable to assess whether the smoking restrictions in the household led to having an intention to quit smoking or vice versa. We were neither able to evaluate the causal direction between household smoking restrictions and intention to quit smoking, nor test the relationship between household smoking restrictions and successful smoking cessation. Although two longitudinal studies (13, 17) mentioned above indicated that stages of change at baseline predicted the adoption of smoking restrictions in the household, the direction in our study is unclear. Further large cohort studies are needed to confirm the directional relationship between these factors. Second, we were unable to evaluate these relationships in women because of the small number of women smokers in the CKATUS data. Larger studies are needed that focus on recruiting Korean American women who smoke. Last, the overall response rate for the survey was only 48%. The response rate varied by region, with the lowest response rate being 43% and the highest, 55%. Although interviewers attempted to complete an interview by calling at least ten times at different times of day and on different days of the week, the response rate was low, possibly leading to selection bias. However, we believe that we compensated for this by using a weighting technique.

In conclusion, we found that household smoking restrictions are associated with an intention to quit smoking among KA adult male smokers in California. The results suggest that the adoption of smoking bans in the household could encourage smokers to quit.

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REFERENCES

1. Levy DT, Romano E, Mumford EA. *Recent trends in home and work smoking bans. Tob Control* 2004; 13: 258-63.
2. Pizacani BA, Martin DP, Stark MJ, Koepsell TD, Thompson B, Diehr P. *Household smoking bans: which households have them and do they work? Prev Med* 2003; 36: 99-107.
3. Blackburn C, Spencer N, Bonas S, Coe C, Dolan A, Moy R. *Effect of strategies to reduce exposure of infants to environmental tobacco smoke in the home: cross sectional survey. BMJ* 2003; 327: 257.
4. Halterman JS, Fagnano M, Conn KM, Szilagyi PG. *Do parents of urban children with persistent asthma ban smoking in their homes and cars? Ambul Pediatr* 2006; 6: 115-9.
5. Wamboldt FS, Balkissoon RC, Rankin AE, Szeffler SJ, Hammond SK, Glasgow RE, Dickinson WP. *Correlates of household smoking bans in low-income families of children with and without asthma. Fam Process* 2008; 47: 81-94.
6. Shelley D, Yerneni R, Hung D, Das D, Fahs M. *The relative effect of household and workplace smoking restriction on health status among Chinese Americans living in New York City. J Urban Health* 2007; 84: 360-71.
7. Pizacani BA, Martin DP, Stark MJ, Koepsell TD, Thompson B, Diehr P. *A prospective study of household smoking bans and subsequent cessation related behaviour: the role of stage of change. Tob Control* 2004; 13: 23-8.
8. Borland R, Yong HH, Cummings KM, Hyland A, Anderson S, Fong GT. *Determinants and consequences of smoke-free homes: findings from the International Tobacco Control (ITC) Four Country Survey. Tob Control* 2006; 15: 42-50.
9. California Health Interview Survey (2007). *CHIS 2005 Adult Public Use File, Release1 [computer file]*, UCLA Center for Health Policy Research, Los Angeles, CA.
10. Carr K, Beers M, Kassebaum T, Chen MS Jr. *California Korean American Tobacco Use Survey-2004. Sacramento, CA: Department of Health Services, 2005.*
11. Merriam-Webster's Online Dictionary. Available at: <http://www.merriam-webster.com/dictionary/acculturation>.
12. Pizacani BA, Martin DP, Stark MJ, Koepsell TD, Thompson B, Diehr P. *Longitudinal study of household smoking ban adoption among households with at least one smoker: Associated factors, barriers, and smoker support. Nicotine Tob Res* 2008; 10: 533-40.
13. Siahpush M, McNeill A, Borland R, Fong GT. *Socioeconomic variations in nicotine dependence, self-efficacy, and intention to quit across four countries: findings from the International Tobacco Control (ITC) Four Country Survey. Tob Control* 2006; 15 Suppl 3: iii71-5.
14. Abdullah AS, Ho LM, Kwan YH, Cheung WL, McGhee SM, Chan WH. *Promoting smoking cessation among the elderly: what are the predictors of intention to quit and successful quitting? J Aging Health* 2006; 18: 552-64.
15. Abdullah AS, Yam HK. *Intention to quit smoking, attempts to quit, and successful quitting among Hong Kong Chinese smokers: population prevalence and predictors. Am J Health Promot* 2005; 19: 346-54.
16. OECD. OECD Health Data 2001. Available at: <http://stats.oecd>.

org/wbos/Index.aspx?DatasetCode=HEALTH

17. Fava JL, Velicer WF, Prochaska JO. *Applying the transtheoretical*

model to a representative sample of smokers. Addict Behav 1995; 20: 189-203.