Individual and Family Factors Associated with Intention to Quit among Male Vietnamese American Smokers: Implications for Intervention Development

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Abstract

Smoking prevalence among Vietnamese American males remains higher than the U.S. general population. This study examined the associations of individual and family factors with quit intention among Vietnamese male smokers in California to guide intervention development to reduce their smoking prevalence. Data for Vietnamese male current smokers (n = 234) in the 2008 California Vietnamese Adult Tobacco Use Survey (N=1,101 males) were analyzed to describe quit intention and previous quit attempts. One-third of Vietnamese male smokers (33%) had no intention to quit at any time, 36% intended to quit soon (in the next 30 days), and 31% intended to quit later (beyond the next 30 days). Half (51.7%) of the sample was in "precontemplation," indicating no intention to quit within 6 months. Many (71%) had made a serious quit attempt in the past year, but 68% of those who tried to quit used no cessation assistance. Multivariate logistic regression adjusting for age, depression, smoking intensity, nicotine dependence, health knowledge, children in the household and home smoking ban revealed that having smoking-related family conflicts and a quit attempt in the past year with or without assistance were independently associated with an intention to quit either in the next 30 days or later. Higher education was associated with no intention to quit. Findings underscore the importance of

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designing strategic interventions that meet the needs of smokers at both individual and family levels to promote quit intention and to facilitate successful quitting in this population.

1. Introduction

Despite declining smoking prevalence in the general U.S. population (Centers for Disease Control and Prevention, 2009), and among Asian men from 2002 to 2006 in selected U.S. communities, smoking prevalence remained higher among non-English speaking Vietnamese men than the general population (Liao et al., 2010). In two studies, Vietnamese men had the highest smoking prevalence (29.5% and 35.4%) among Asian Americans (California Health Interview Survey, 2008; Chae, Gavin, & Takeuchi, 2006). Our 2008 California Vietnamese Adult Tobacco Use Survey (CVATUS), the first statewide population-based survey conducted in both Vietnamese and English, reported a current smoking prevalence of 25% among males and <1% among females (Tong et al., 2010).

Vietnamese Americans are at high risk for smoking due to sociodemographic factors consistently correlated with higher smoking, including lower acculturation, limited English proficiency, and lower educational attainment (An, Cochran, Mays, & McCarthy, 2008; Chae, et al., 2006; Kim, Ziedonis, & Chen, 2007; Tang, Shimizu, & Chen, 2005). Half of the Vietnamese American population immigrated after 1990, with 88% speaking Vietnamese at home and 55% speaking English less than "very well" (U.S. Census Bureau, 2007). Compared to all other Asian ethnic groups, they have the fewest (70%) high school graduates, and the second highest (14%) poverty rate (U.S. Census Bureau, 2007). Likely, additional contributing factors specific to this community include low level of knowledge about smoking-related health risks (Ma et al., 2005; Ma, Tan, Toubbeh, & Su, 2003), high social acceptability of smoking (Chan et al., 2007), the continuing influx of immigrants from Vietnam where male smoking prevalence is high (42% in 2008) (World Health Organization, 2008), and low quit intention. Large scale surveys among Vietnamese American smokers showed that 52% to 76% were in "precontemplation" indicating no intention to quit smoking in the next 6 months (Chan, et al., 2007; Wiecha, Lee, & Hodgkins, 1998). Thus, effective strategies to promote smoking cessation among Vietnamese American men should address their low intention to quit, which is associated with high smoking prevalence across populations (Etter, 2004; Thyrian et al., 2008) and poor smoking cessation outcomes (Haug et al., 2010).

Evidence-based interventions targeting Asian American smokers are lacking (Chen & Tang, 2007; Fiore et al., 2008; Kim, et al., 2007; Ranney, Melvin, Lux, McClain, & Lohr, 2006). To date, only five published controlled trials specifically target Asian Americans; they include two community-based media-led interventions targeting Vietnamese (Jenkins et al., 1997; McPhee et al., 1995), one program utilizing lay health worker outreach targeting Southeast Asian men (Chen, 2001), one testing a single session counseling intervention with nicotine replacement targeting Chinese and Korean American smokers (Fang et al., 2006), and one using individual motivational interviewing and nicotine replacement targeting Chinese Americans (Wu et al., 2009). Among the 3 studies with Vietnamese Americans, only one 3-year community-based media campaign intervention demonstrated a significant treatment effect with lower smoking prevalence in the intervention community compared to the control community (Jenkins, et al., 1997).

Empirical evidence underscores the strengths of the Transtheoretical Model of Change (TTM) (DiClemente, Prochaska, Fairhurst, Velicer, & Rossi, 1991; Prochaska & Velicer, 1997) when tailoring interventions by stages of change for smokers in community and clinical settings, including non-English speaking Asian smokers (Haug et al., 2010; Velicer, Prochaska, & Redding, 2006; Wu, et al., 2009). The TTM is a promising intervention framework to promote smoking cessation among Vietnamese American men by addressing their low intention to quit (Chan, et al., 2007; Wiecha, et al., 1998). However, some researchers criticize TTM's heavy emphasis of individual determinants with little consideration of social or familial factors (Glanz & Bishop, 2010; Koshy, Mackenzie, Tappin, & Bauld, 2010) found to be associated with intention to quit smoking (Myung, McDonnell, Kazinets, Seo, & Moskowitz, 2010; Wiecha, et al., 1998) and smoking cessation outcomes among Asian American smokers (Spigner, Yip, Huang, & Tu, 2007).

The family is central to health behaviors for Asian Americans (Kagawa-Singer & Blackhall, 2001; McPhee, 2002; Nilchaikovit, Hill, & Holland, 1993). Perceived encouragement from family was described as the most helpful facilitator for cessation among Chinese and Vietnamese Americans (Spigner, et al., 2007). Significantly more calls are made to the Asian-language California Smokers' Helpline from smokers' family and friends ("proxy calls") as compared to the English-language Helpline (40% vs. 6%) (Zhu, Anderson, Johnson, Tedeschi, & Roeseler, 2000) . This unique `proxy call' phenomenon observed among Asian-language speakers highlights the potential significance of family involvement in smoking cessation.

How family factors influence intention to quit smoking or the smoking cessation process among Asians remains unclear. Vietnamese American male smokers who intended to quit were more likely to report that their family was upset about their smoking than those with no intention to quit (Wiecha, et al., 1998). Among Korean American male smokers, intention to quit was associated with self-report of having smoking restrictions at home, ranging from complete prohibition ("smoking ban") to some limitations (Myung, et al., 2010). In China, an educational intervention delivered to mothers of sick children led to smoking cessation at 3 months among fathers who smoked (Chan, Leung, Wong, & Lam, 2008). Being married predicted both smoking abstinence and reduction among motivated smokers in China (Sun et al., 2009).

No study to date has used multivariate techniques to examine both individual and family factors simultaneously in their associations with quit intentions in Vietnamese American male smokers. Using the population-based data from the 2008 CVATUS and the intention component of the stages of change construct from TTM as a framework, this study examined correlates of quit intentions, including both individual factors (demographics, smoking intensity, nicotine dependence, and previous quit attempt experience) and family factors (marital status, children in household, home smoking ban, report of smoking-related family conflicts), in order to identify new approaches to smoking cessation interventions among Vietnamese American smokers.

2. Methods

2.1 Data source description

The CVATUS was a statewide computer-assisted telephone interview survey conducted in Vietnamese and English of 1,101 Vietnamese men and 1,078 Vietnamese women in California in 2007–2008. Details about the survey and sampling are reported elsewhere (Tong, et al., 2010). In brief, a list of the 55 most common Vietnamese surnames (Lauderdale & Kestenbaum, 2000; Swallen et al., 1998; Taylor, Nguyen, Hoai Do, Li, & Yasui, 2009) was used to provide a random sample of 13,000 numbers from all residential

telephone landline numbers. Respondents were eligible if they were reached at a private residence, were 18 years of age or older, self-identified as Vietnamese, and spoke English or Vietnamese. Of all eligible respondents contacted, 63.5% participated in the survey.

2.2 Sample selection

Out of 2,179 respondents, 1,078 women were excluded from this analysis because of their low current smoking rate (< 1%). Among 1,101 men, 260 (25%) were current smokers, defined as having smoked at least 100 cigarettes in their life and currently smoking "every day" or "some days." Twenty-six of the 260 current smokers were excluded because they did not indicate whether or not they would like to stop smoking. Thus, data from 234 Vietnamese current male smokers were included in the current analyses. When compared to the study sample, the excluded smokers were similar except that they were more likely to report alcohol use in the past month (65.2% vs. 34.8%, p = 0.021), and less likely to have traveled to Vietnam (41.2% vs. 73.9%, p = 0.003).

2.3 Dependent variable

Quit intention was determined first by asking "Would you like to stop smoking?" Those who responded "yes" were asked "Are you planning to quit smoking in the next 30 days?" Respondents who indicated "no" or "not sure" were then asked "Are you contemplating quitting smoking in the next 6 months?" This approach was adapted from the intention component of the stages of change defined by TTM (Prochaska & Velicer, 1997) and was comparable to other recent surveys reporting intention to quit in Asian American populations (Carr, Beers, & Chen, 2005; Ma, et al., 2003; Myung, et al., 2010). Four levels of quit intention could be established from these questions: no quit intention (would not like to stop smoking); intend to quit within the next 30 days; intend to quit in the next 6 months but not in 30 days; and intend to quit but beyond the next 6 months. The proportions of smokers who intended to quit but not in the next 6 months or who intended to quit within 6 months were too small (17.6% and 13%, respectively) to allow for meaningful analyses as individual intention categories; therefore, these smokers were combined into one group for subsequent analyses. Thus, three intention groups were used in the analyses: 1) no quit intention; 2) intend to quit soon (in the next 30 days); and 3) intend to quit later (would like to stop smoking but not within the next 30 days).

2.4 Independent variables

2.4.1. Individual factors—Demographic variables at the individual level were age, education, poverty level based on household size (U.S. Department of Health and Human Services, 2008), employment, religion (Buddhist, Christian, or other), number of years in the U.S., and language of the interview (Vietnamese or English). Health-related variables were health insurance status, whether the respondent had a doctor visit in the last 12 months, self-perceived general health (excellent, very good, good, fair, or poor), use of alcohol >1 day in the past month, and depression. We assessed depression by the frequency of 4 symptoms experienced in the past week (1 = not at all to 4 = extremely; total score 4 –16; Cronbach's alpha = 0.71). The items, selected from a larger depression scale previously validated among Vietnamese (Hinton et al., 1998) and demonstrated to be significantly associated with Vietnamese American male smoking status (Wiecha, et al., 1998), were: 1) *feeling low or slowed down*; 2) *difficulty falling or staying asleep*; 3) *worrying too much about things*; and 4) *feeling sad or "blue."* Life experiences in Vietnam were assessed by asking respondents whether they had served in the Vietnamese military or police, been in a Vietnamese "re-education" (concentration) camp or a refugee (resettlement) camp, and ever traveled back to Vietnam. Health knowledge was assessed by a scale (Cronbach's alpha for study sample = 0.56) constructed based on the sum of responses (correct = +1, incorrect = −1, and missing

response = 0) to four questions: 1) Among those who smoke less than 5 cigarettes per day, the risk of developing cancer is the same as among those who never smoke; 2) Among those who smoke less than 5 cigarettes per day, the risk of developing heart disease is the same as among those who never smoke; 3) *Smoking "light" cigarettes is the same as smoking "regular" cigarettes*; and 4) *Tobacco is not as addictive as other drugs*. Smoking history and behaviors were assessed by: 1) age at which respondents first started smoking cigarettes regularly; 2) number of cigarettes smoked on a typical day when they smoked (smoking intensity); and 3) time to first cigarette after waking up, an item taken from the Fagerstrom Test of Nicotine Dependence (Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991) and used as a measure of nicotine dependence (Baker et al., 2007). Attitudes toward smoking were assessed by respondents' agreement (yes or no) to the two statements separately: i) "Smoking is harming my health"; and ii) "I am addicted to cigarettes." Previous quit attempt experience was assessed by asking respondents if they ever had a quit attempt (defined as not smoking for 1 day or longer with the purpose of trying to stop smoking) and, if so, within the past 12 months. Respondents who had ever attempted to quit were asked to indicate their use of smoking cessation assistance in the attempt.

2.4.2. Family factors—At the family level, four variables were included in the analyses: 1) marital status (married or living with partner vs. others); 2) living with children age < 18 in the household (yes or no); 3) household smoking ban: "Is smoking allowed inside your home?" (yes or no); and 4) experience of smoking-related family conflicts: "Has smoking caused problems or conflict in your family?" (yes or no). These four variables were selected because of their associations with intention to quit smoking or smoking cessation outcomes among Asian smokers (e.g., Chan, et al., 2008; Kim, 2008; Myung, et al., 2010; Spigner, et al., 2007; Sun, et al., 2009).

2.5 Statistical Analyses

Data were analyzed using SAS (version 9.2, SAS Institute, Cary, NC). The population weight variable, based on population estimates developed by the Bureau of the Census in year 2000, was used to calculate the summary statistics and standard errors. Weighted Rao-Scott chi-square tests were used for categorical data and weighted logistic regression models for continuous variables to examine the bivariate associations of each variable with the 3 intention to quit categories (no quit intention, intend to quit soon, and intend to quit later). Multinomial logistic regression was then conducted to examine factors associated with these 3 quit intention categories. A weighted logistic regression was performed on the generalized logits. The model included preselected *a priori* covariates which have been found to be associated with quit intention or current smoking in the literature and variables that attained a p-value ≤ 0.25 in the bivariate comparisons (Hosmer & Lemeshow, 1989). The set of *a priori* covariates included: age, marital status, education, depression, number of cigarettes smoked, time to first cigarette after waking, health knowledge, and previous quit attempt experience.

Because previous quit attempt has been found to be a consistent factor associated with intention to quit in the literature and an indicator of past quit intention (e.g., Hyland et al., 2006; Leatherdale & Shields, 2009), we conducted the multinomial logistic regression in two separate models: Model 1 included the selected covariates without past quit attempt experience; Model 2 added past quit attempt experience. To maximize sample size, we included in the multivariate logistic regression models an `unknown' category for covariates with 3% or more of missing data. To address multicollinearity between previous quit attempt and use of smoking assistance in the models, we combined the two variables into a single variable with 3 categories: quit attempt within the past 12 months with any cessation assistance; quit attempt within the past 12 months without cessation assistance; and no

previous quit attempt or quit attempt > 12 months ago. For each multivariate model, we computed the variance inflation factors as a multicollinearity diagnostic statistic to assess the impact of interdependencies among the covariates included in the model (Belsley, Kuh, & Welsch, 1980; Leahy, 2001). The computed variance inflation factors suggested only weak dependencies and therefore no additional modifications were made to the variables included in the multivariate models.

3. Results

3.1 Sample characteristics

Table 1 shows the characteristics at the individual and family levels of the study sample (n=234) by intention to quit smoking. Most participants (86%) completed the interview in Vietnamese. More than 70% were married and had children in their household. Over 90% reported a smoking ban at home; about 40% reported that smoking had caused conflicts in the family. A majority (78%) smoked daily in the last month; nearly half (46.6%) smoked < 10 cigarettes on the days smoked and 63% smoked within 60 minutes after waking. Almost all (97%) agreed that smoking was harmful to their health, and 66% said they were addicted to cigarettes. Table 2 presents previous quit attempt experience of the entire sample and of the three quit intention groups. About one-fifth (19%) had never made a quit attempt; 71% reported quitting smoking for at least 1 day within the past 12 months. Among those who had a quit attempt, 68% reported no use of any cessation assistance in their last attempt. Of those who used any assistance, nicotine replacement medication was the most frequently utilized resource, reported by 23.4% of the smokers who had ever quit smoking.

3.2 Intention to quit smoking

One-third (33.0%) had no quit intention, 36.4% intended to quit soon (within the next 30 days), and 30.6% intended to quit later (beyond the next 30 days). Half (51.7%) of the sample was in the "precontemplation" stage of the TTM (Prochaska & Velicer, 1997), indicating no intention to quit within 6 months.

3.3 Correlates of intention to quit

In bivariate analyses (Tables 1 and 2), two individual factors, agreeing to being addicted to cigarettes and having a previous quit attempt in the past year, and two family factors, having children in the household and experiencing smoking-related family conflicts, were significantly associated with quit intention (p < 0.05). Table 3 shows the two multivariate regression models using "no quit intention" as the reference category adjusted for the selected factors at the individual level (age, education, depression, smoking attitudes, smoking intensity, and nicotine dependence, health knowledge) and family level (marital status, children in the household, home smoking ban, and smoking-related family conflicts). Without consideration of previous quit attempt experience (Model 1), those who intended to quit soon were more likely than those with no quit intention to admit being addicted to cigarettes and to report smoking-related family conflicts, while those who intended to quit later had lower education, were more likely to agree that smoking was harmful to their health and to report smoking-related family conflicts. Model 2 shows that having a quit attempt within the past 12 months with or without cessation assistance was significantly associated with intention to quit in any time frame. Lower education remained significantly associated with intention to quit later and a similar trend was observed for those with intention to quit soon (p = 0.07). While smoking attitude variables were no longer associated with quit intention, smoking-related family conflicts remained significantly associated with quit intention. Both Models 1 and 2 were conducted using `quit later' as the reference category (not shown) and revealed no difference in the individual and family factors examined between smokers with intention to quit soon and those who intended to quit later.

4. Discussion

This population-based study showed that one-third of Vietnamese male smokers in California never intend to quit smoking and that half were in "precontemplation," with no intention to quit in the next 6 months. This is much greater than California smokers in general who are in "precontemplation" (25%) (California Department of Public Health California Tobacco Control Program, 2008). Given low smoking prevalence in California (Centers for Disease Control and Prevention, 2009; Messer et al., 2007), a high proportion of unmotivated Vietnamese male smokers underscores the need to develop new strategies to promote smoking cessation in this subgroup. Ours is also the first study to use multivariate analyses to examine the association between both individual and family correlates and Vietnamese American men's quit intentions. The significant individual and family correlates that distinguished smokers who had no intention to quit and those who intended to quit were: education, recent quit attempt, and experience of smoking-related family conflicts. Our analyses, however, did not reveal individual or family differences between intention to quit soon (within the next 30 days) versus later (beyond 30 days). Thus, additional research is warranted to understand how to facilitate temporal correlates of quit intentions.

4.1 Individual correlates of quit intention

A previous quit attempt in the past year (with or without cessation assistance) and lower education were significantly correlated with intention to quit. Lower education has been consistently associated with higher smoking prevalence in this and other populations (Centers for Disease Control and Prevention, 2007; Tong, et al., 2010; Wiecha, et al., 1998), but the association between education and quit intention is less clear. No association between education and quit intention has been reported in other population-based studies (e.g., Etter, Perneger, & Ronchi, 1997; Leatherdale & Shields, 2009). Our current finding was consistent with that of Ma and colleagues (2003) where Asian smokers with lower education were more motivated to quit smoking. However, our finding differs from other studies which showed that lower education was associated with low intention to quit smoking in the U.S. general population (Velicer et al., 1995), in California Korean male smokers (Myung, et al., 2010), and in Massachusetts Vietnamese male smokers in bivariate comparisons (Wiecha, et al., 1998). Explanations for the difference in our finding and that of Wiecha et al. (1998) could be the result of multivariate versus bivariate comparisons, or of differences in the study samples, when the studies were fielded, and tobacco control environments. Although our analyses do not explain the association between education and quit intention, a potential explanation may be found in a recent study, which suggested that more educated smokers were more likely to be influenced by their friends regarding quitting smoking (Christakis & Fowler, 2008). In the context of high social acceptability among Vietnamese males (Chan, et al., 2007) and high smoking prevalence in Vietnam (World Health Organization, 2008), the observed association between higher education and no intention to quit could be due to social encouragement, which may resonate particularly with more educated Vietnamese smokers. An important implication of this finding is that tobacco control efforts may need to stratify Vietnamese male smokers by education level to improve tailored cessation interventions.

Consistent with prior research (e.g., Leatherdale & Shields, 2009), Vietnamese smokers who made a quit attempt in the past year were more motivated to quit smoking. The bivariate finding suggested that higher proportions of smokers who intended to quit reported prior use of any cessation assistance than those who had no intention to quit. In multivariate analyses, the odds ratio associated with intention to quit was higher for those who had used cessation assistance in a recent quit attempt when compared to those who did not use assistance. However, due to the small sample size, the confidence intervals were wide and differences were not statistically significant. Future research should examine the impact of cessation

resources on future intention to quit smoking with a larger sample of Vietnamese male smokers.

Two attitudes, agreeing that smoking was harmful to one's health and thinking that one was addicted to cigarettes, were associated with intention to quit, but only when not adjusting for previous quit attempts. It is plausible that certain smoking attitudes facilitate smokers to think about quitting and thus promote quit intention especially among those who had not attempted to quit ever or recently. We explored potential interaction effects between each smoking attitude factor and previous quit attempt for any associations with quit intention and found no significant interaction effect. However, the current finding suggests that interventions to increase a smoker's likelihood to make a quit attempt could be more effective in increasing subsequent quit intention than by changing smoking attitudes alone.

4.2 Family correlates of quit intention

Having children in the household and having a smoking ban at home were strongly associated with intending to quit in bivariate comparisons but were no longer significant after adjusting for family conflicts related to smoking. Of note, the experience of smoking-related family conflicts remained a significant correlate even after previous quit attempt and other factors were adjusted in the multivariate model. Our findings imply that family interactions related to smoking behaviors are a strong influence for smokers' intention to quit. The dynamics of smoking-related family conflicts and how these dynamics influence intention to quit smoking need to be examined further qualitatively and quantitatively.

4.3 Intervention framework and strategies at individual and family levels to reduce smoking prevalence among Vietnamese male smokers

The TTM framework (Velicer, et al., 2006) is promising as a theoretical framework for developing intervention strategies by promoting Vietnamese smokers' intention to quit. Our findings also underscore the potential importance of strategically utilizing family influence to affect smokers' intention to quit. Growing evidence has supported the importance of social context in health behaviors (Burke, Joseph, Pasick, & Barker, 2009; Christakis, 2004; Smith & Christakis, 2008), including smoking cessation (Christakis & Fowler, 2008). Social Network Theory offers a useful framework to understand how social networks affect health behaviors through various mechanisms (Berkman & Glass, 2000; Smith & Christakis, 2008). Our findings of significant correlates identified at both individual and family levels provide impetus to integrate TTM and Social Network Theory in creating interventions tailored at both individual and family levels.

Tobacco control efforts need to consider that many Vietnamese male smokers are highly educated and do not intend to quit in the near future. A recent study with French smokers suggested that highly educated smokers who presented for smoking cessation treatments were more likely to indicate social concerns such as desiring to set a positive example for their family and friends and perceiving the negative image of smokers as their motivation to quit (Baha & Le Faou, 2010). The Framingham Heart Study revealed social marginalization among more educated smokers, which implies higher social costs paid for smoking by these smokers (Christakis & Fowler, 2008). These studies suggest that message framing around social motivations for quitting might be relevant for educated smokers; whether such a strategy is applicable for Vietnamese male smokers requires further examination.

The association between a recent quit attempt and intention to quit supports intervention strategies that encourage or challenge smokers to attempt to stop smoking or achieve temporary abstinence. In 1995–96, our research team organized two "Quit & Win" smoking cessation contests for Vietnamese smokers in Santa Clara, CA. A total of 89 smokers quit in

order to enter the contest and be eligible for prizes; selected winners had saliva cotinine validation of successful quitting. At 6-month follow-up, 64 (72%) remained abstinent by self-report (Lai, McPhee, Jenkins, & Wong, 2000). Community-wide campaigns encouraging `smoke-free' days on the Vietnamese *Tet* New Year's Day, for example, or "Quit & Win" contests can be considered as strategies to increase motivation to quit smoking in this population. In addition, smokers should be informed that successful long-term smoking cessation often requires multiple quit attempts because nicotine is addictive and tobacco use may be a chronic relapsing condition (Fiore, et al., 2008). Intervention components that encourage and guide Vietnamese male smokers to learn from previous quit attempts and to understand that each attempt is a step closer to complete cessation are relevant.

Our analyses revealed that most Vietnamese smokers (68%) did not use existing smoking cessation resources, similar to California smokers in general (75%) (California Department of Public Health California Tobacco Control Program, 2008). Of note, only 3% of Vietnamese male smokers in the study sample had used the statewide telephone counseling service, even though the service is free and available in the Vietnamese language. Thus, it will be important to promote the use of available smoking cessation resources among Vietnamese men by increasing awareness, cultural acceptability and perceived efficacy of these resources.

Our findings imply that smoking-related family conflicts might create opportunities to promote intention to quit smoking. For example, preliminary evidence from family consultation interventions involving couples yielded 50% verified abstinence at 6 months for smokers who used to continue smoking despite chronic health conditions (Shoham, Rohrbaugh, Trost, & Muramoto, 2006). Family involvement may facilitate the process of smoking cessation through a variety of mechanisms proposed by the Social Network Theory constructs (Berkman & Glass, 2000; Smith & Christakis, 2008), which could be integrated with the TTM framework. Mechanisms of support tailored to smokers' stages of change may include: emotional support by demonstrating understanding of smokers' ambivalence around quitting; appraisal support in helping with decision-making about quitting; informational support in providing information about smoking risks and cessation resources; and instrumental support in finding activities to replace smoking or helping smokers to cope with withdrawal symptoms. The family can facilitate access to smoking cessation resources by bringing needed interventions to smokers. Providing telephone training to support persons in a pilot study with English-speaking smokers demonstrated feasibility in the smoker's use of a quitline (Patten et al., 2009). Future research examining how to effectively involve the Vietnamese smoker's family in smoking cessation efforts is warranted.

4.4 Limitations

Prior research suggests that intention to quit smoking may be a necessary but not sufficient condition for predicting cessation (Hyland et al., 2004). The cross-sectional nature of the current study did not allow a prospective examination of predictors associated with quit attempts and successful smoking cessation outcomes. Similarly, a causal mechanism between the correlates and quit intentions could not be established. Data were obtained from self-report; smoking status and presence of home smoking bans were not validated. The generalizability of our findings to smokers in Vietnamese communities outside California is uncertain. Finally, the sample size included in the analyses might not be sufficient for examination of potential interaction effects among the individual and family correlates in their associations with quit intention. Nonetheless, the current study is based on data from the largest and only in-language statewide population-based survey focused on Vietnamese adults in the U.S. This is also the first published study to use a multivariate model to

examine individual and family factors associated with quit intentions among Vietnamese smokers.

4.5 Conclusions

This study identified significant correlates at both the individual and family levels of quit intention among Vietnamese male smokers. For Vietnamese male smokers with low motivation to quit, encouraging even short-term quit attempts and involving the family are potential strategies to promote intention to quit. For Vietnamese male smokers who are motivated to quit, promising interventions may include enabling smokers to make use of lessons learned from previous quit attempts, facilitating use of evidence-based cessation assistance, and involving the family in initiating and maintaining abstinence. To address the high smoking prevalence in Vietnamese American men, interventions must provide support at both individual and family levels.

Research Highlights

- 33% of Vietnamese male smokers in California had no intention to quit smoking

- Higher education was associated with no intention to quit in Vietnamese men

- Recent quit attempts with or without assistance was associated with quit intention

- Intention to quit was associated with experiencing smoking-related family conflicts

- Interventions should support smokers' needs at both individual and family levels

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TABLE 1

Characteristics of the Vietnamese Adult Male Smokers, Whole Sample and by Intention to Quit Smoking, CVATUS 2008

		All (N = 234)	No Quit intention (n = 77)	Intention to Quit Smoking			p-values[a]
				Intend to Quit Later (>30 days) (n = 76)	Intend to Quit Soon (≤ 30 days) (n = 81)		
INDIVIDUAL FACTORS							
Demographics							
Age	Mean ± SE	40.2 ± 1.1	41.0 ± 1.7	41.6 ± 1.7	38.3 ± 2.0		0.45
Education							
	< High school	17.7%	15.4%	20.4%	17.6%		0.81
	High school	34.8%	28.7%	39.6%	35.9%		
	Some college	31.2%	35.3%	28.2%	30.5%		
	College or above	16.3%	20.6%	11.9%	16.1%		
Poverty level							
	Above	69.3%	71.6%	73.1%	64.0%		0.80
	Below	14.0%	10.8%	15.2%	15.9%		
	Unknown	16.7%	17.6%	11.7%	20.1%		
Employed		71.6%	76.0%	71.2%	68.0%		0.69
Religion							
	Buddhist	40.9%	39.2%	50.8%	34.1%		0.58
	Christian	35.2%	35.7%	30.6%	38.7%		
	Other/None	23.8%	25.0%	18.5%	27.2%		
Years in U.S. < 15 years		40.5%	35.2%	39.3%	45.2%		0.59
Survey language	Vietnamese	86.4%	88.1%	89.0%	82.7%		0.74
	English	13.6%	11.9%	11.0%	17.3%		
Health access and status							
Had health insurance		72.0%	72.3%	75.0%	69.2%		0.84
Visited a physician in past 12 months		62.9%	61.5%	64.1%	63.0%		0.97
General health - Fair/poor		43.0%	48.5%	45.1%	36.2%		0.39
Used alcohol in the past month		63.5%	56.8%	65.6%	67.9%		0.40
Depression, score ranged from 4 (none) to 16 (most frequently)							
	Mean ± SE	6.5 ± 0.2	6.4 ± 0.3	6.7 ± 0.2	6.5 ± 0.3		0.70

	All (N = 234)	Intention to Quit Smoking			p-values[a]
		No Quit intention (n = 77)	Intend to Quit Later (>30 days) (n = 76)	Intend to Quit Soon (≤ 30 days) (n = 81)	
Life experiences in Vietnam					
Served in military or police	12.2%	13.7 %	10.9%	11.9%	0.49
In re-education camp	9.1%	9.5%	9.0%	8.7%	0.94
In refugee camp	40.3%	38.9%	35.7%	45.5%	0.58
Smoking history and behaviors					
Age started smoking regularly (n)[b]	(217)	(68)	(73)	(76)	
Mean ± SE	20.9 ± 0.4	20.6 ± 0.7	21.0 ± 0.6	21.0 ± 0.7	0.86
Smoked daily past month	78.4%	73.6%	78.0%	83.0%	0.53
Cigarettes smoked per day					
<10	48.1%	54.1%	47.3%	43.2%	0.70
10–19	33.4%	27.2%	29.4%	42.2%	
≥20	13.3%	14.0%	16.5%	9.8%	
unknown	5.3%	4.6%	6.7%	4.7%	
Time to first cigarette after waking					
within 5 minutes	13.7%	15.9%	12.3%	13.0%	0.16
6–30 minutes	25.8%	20.2%	22.2%	34.0%	
31–60 minutes	23.5%	22.2%	28.2%	20.6%	
> 60 minutes	23.4%	18.3%	23.9%	27.7%	
unknown	13.5%	23.4%	13.4%	4.7%	
Smoking attitudes (agreed)					
Smoking is harming my health	97.1%	94.4%	98.7%	98.5%	0.07
I am addicted to cigarettes	66.4%	51.7%	66.9%	84.1%	**<0.01**
Health knowledge of smoking risks, score ranged from −4 to 4					
Mean ±SE	1.2 ± 0.2	1.4 ± 0.3	1.1 ± 0.3	0.9 ± 0.3	0.39
FAMILY FACTORS					
Married, living with partner	72.3%	70.2%	78.1%	69.4%	0.84
Had children in household	74.2%	62.3%	74.8%	84.6%	**0.02**
Smoking not allowed inside home	93.1%	87.1%	96.3%	95.9%	0.07

	All (N = 234)	Intention to Quit Smoking			p-values[a]
		No Quit intention (n = 77)	Intend to Quit Later (>30 days) (n = 76)	Intend to Quit Soon (≤ 30 days) (n = 81)	
Reported smoking had caused family conflicts	39.9%	23.8%	44.2%	51.1%	**0.02**

Notes: Percentages reported were weighted and computed with missing data included. Percentages may not add up exactly to 100% due to rounding error. Missing data ranged from 0% to 3% for all variables except when otherwise noted in the table with an "unknown" category.

[a] p-values for the comparison among quit intention status.

[b] n refers to the number of individuals who provided age started smoking regularly.

Table 2

Previous Quit Attempt Experience Reported by Vietnamese Male Current Smoker Respondents, CVATUS 2008

(n = number of individuals responded)	All (m)	No Quit intention (n)	Intention to Quit Smoking		p-value*
			Intend to Quit Later (>30 days) (n)	Intend to Quit Soon (≤30 days) (n)	
Previous Quit Attempt	(234)	(77)	(76)	(81)	**<0.001**
Never made a quit attempt	18.7%	37.0%	10.6%	8.9%	
Last attempt > 12 months ago	10.2%	18.0%	7.9%	5.2%	
Last attempt within past 12 months	71.1%	44.9%	81.6%	85.9%	
Referring to the last quit attempt: [a]					
Use of any cessation assistance [b]	(183)	(44)	(65)	(74)	**<0.01**
	31.8%	16.3%	30.1%	43.0%	
Types of assistance utilized [c]	(183)	(44)	(65)	(74)	
Nicotine replacement medications such as a patch or gum	23.4%	15.9%	26.9%	29.7%	0.42
Pills such as bupropion[d]	2.9%	0.0%	4.1%	2.4%	-
Face-to-face advice from a professional	10.9%	8.0%	2.1%	14.7%	**0.04**
Group advice	1.7%	1.0%	0.0%	3.5%	-
Called a 1 800 quitline	3.1%	1.0%	3.4%	4.0%	0.52
Self-help materials, such as a quit kit or booklet	2.7%	2.1%	2.1%	3.5%	0.76

*
p-values based on weighted chi-square or regression model for comparison across quit intention status; p-values not produced if 0% or 100% in any category.

[a]
Data were obtained from 183 smokers who reported having ever made a quit attempt.

[b]
Use of one or more of the smoking resources listed (nicotine replacement medications, other smoking cessation medications, face-to-face or group advice, quitline, or self-help materials).

[c]
% not mutually exclusive.

[d]
Varenicline was not included as an example of other non-nicotine medications in the survey because it was not FDA approved at the time the data collection began.

Table 3

Multivariate Models Describing Correlates of Intention to Quit Smoking among Vietnamese Male Current Smokers, CVATUS 2008 (N = 234)

	Model 1 (excluding Previous Quit Attempt Experience) Maximum rescaled R-Square = 0.36				Model 2 (including Previous Quit Attempt Experience) Maximum rescaled R-Square = 0.41			
	Intend to Quit Later vs. No Quit Intention		Intend to Quit Soon vs. No Quit Intention		Intend to Quit Later vs. No Quit Intention		Intend to Quit Soon vs. No Quit Intention	
Variables	OR (95 % CI)	p	OR (95 % CI)	p	OR (95 % CI)	p	OR (95 % CI)	p
Education								
< High school	**4.49 (1.05 – 19.12)**	**0.04**	2.32 (0.51 – 10.58)	0.28	**7.74 (1.36 – 44.04)**	**0.02**	4.48 (0.90 – 1.02)	0.07
High school	**5.04 (1.23 – 20.61)**	**0.02**	2.78 (0.68 – 11.38)	0.15	**6.83 (1.30 – 35.89)**	**0.02**	3.96 (0.89 – 17.57)	0.07
Some college	1.62 (0.42 – 6.33)	0.49	0.81 (0.21 – 3.05)	0.75	1.98 (0.42 – 9.29)	0.39	0.89 (0.24 – 3.27)	0.86
College or above	referent		referent		referent			
Smoking Attitude: "Smoking is harming my health"								
Yes	**8.23 (1.19 – 57.02)**	**0.03**	6.40 (0.42 – 91.05)	0.18	9.72 (0.59 – 159.8)	0.11	10.53 (0.11 – 999)	0.32
No	referent		referent		referent		referent	
Smoking Attitude: "I am addicted to cigarettes"								
Yes	1.35 (0.52 – 3.46)	0.54	**3.45 (1.16 – 10.32)**	**0.03**	0.98 (0.36 – 2.67)	0.96	2.64 (0.81 – 8.59)	0.11
No	referent		referent		referent		referent	
Smoking had caused family conflicts								
Yes	**3.20 (1.21 – 8.47)**	**0.02**	**4.51 (1.61 – 12.61)**	**<0.01**	**3.31 (1.21 – 9.08)**	**0.02**	**4.76 (1.64 – 13.65)**	**<0.01**
No	referent		referent		referent		referent	
Last quit attempt was within past 12 months								
Yes, with assistance					**11.95 (2.22 –64.27)**	**<0.01**	**20.82 (3.83 –113.15)**	**<0.01**
Yes, with no assistance					**9.36 (2.71 –32.36)**	**<0.01**	**9.42 (2.27 –39.09)**	**<0.01**

	Model 1 (excluding Previous Quit Attempt Experience) Maximum rescaled R-Square = 0.36		Model 2 (including Previous Quit Attempt Experience) Maximum rescaled R-Square = 0.41	
	Intend to Quit Later vs. No Quit Intention	Intend to Quit Soon vs. No Quit Intention	Intend to Quit Later vs. No Quit Intention	Intend to Quit Soon vs. No Quit Intention
No (never or > 12 months ago)			Referent	Referent

Note: "Quit later" and "quit soon" were jointly modeled using multinomial logistic regression using "no quit intention" as the reference group; all models were controlled for the following individual factors: age, depression, number of cigarettes smoked per day, time to first cigarette after waking, health knowledge of smoking risks; and for the following family factors: marital status, children in the household, home smoking ban.