Identifying demographic and psychosocial factors related to the escalation of smoking behavior among Mexican American adolescents

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ABSTRACT

Cigarette smoking is the leading preventable cause of death in the United States; smoking in Mexican American adolescents, a rapidly growing population, remains a major concern. Factors associated with escalation or progression along the smoking trajectory have not been studied in adolescent Mexican Americans. A better understanding of escalation is needed for cancer prevention and overall health.
N = 1,328 Mexican American adolescents joined a cohort in 2005–06. At baseline participants provided demographic, acculturation and psychosocial data, and reported their smoking status using the Minnesota Smoking Index. Those that never tried a cigarette or only had a few puffs in their life were included in this study. The primary outcome of interest, escalation in smoking status, was defined as moving up the Minnesota Smoking Index by 2010–2011. The current analysis is based on 973 participants of whom 48.2% were male, mean age = 11.8 (SD = 0.8), and 26.0% were born in Mexico.
By 2010–2011, 283 (29%) escalated their smoking status and 690 (71%) remained the same. Being older (OR = 1.30; CI = 1.07–1.57), male (OR = 1.88, CI = 1.40–2.53), having higher levels of anxiety (OR = 1.03, CI = 1.02–1.05), intending to smoke (OR = 1.70, CI = 1.18–2.46), having friends who smoke (OR = 1.73, CI = 1.12–2.70) and having parents' friends who smoke (OR = 1.38, CI = 1.02–1.88) increased risk for smoking escalation. Higher levels of subjective social status (OR = 0.91, CI = 0.83–0.99) were protective against smoking escalation. Contrasting previous work in smoking experimentation, parents' friends influence was a stronger predictor than the family household influence. Preventative interventions for Mexican American youth could address this risk factor to reduce smoking escalation.

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1. Introduction

Smoking causes many types of cancers, remaining the leading cause of cancer-related death in the United States (U.S.) (U.S. Department of Health and Human Services, 2014) and contributes to the overall burden of disease (American Cancer Society, 2015; Doll et al., 2004). Despite the fact that rates of cigarette use on the whole have been decreasing annually (Mendez and Warner, 2004), over 400,000 deaths per year in the last decade are attributed to smoking (U.S. Department of Health and Human Services, 2014). In addition, cigarette smoking greatly reduces the quality of cognitive and physical performance (Doll and Hill, 2004; Richards et al., 2003). Using the U.S. National Health Interview Survey data from 1997 to 2004, Jha et al.(Jha et al., 2013) estimated hazard ratios of a smoker's death as compared to a non-smoker, adjusting for age, education level, adiposity, and alcohol

consumption, and noted that smokers lost at least 10 years of their life compared to non-smokers. Thus, cigarette smoking remains a major issue in cancer prevention and overall health.

About 9 out of 10 smokers began smoking before the age of 18 (U.S. Department of Health and Human Services, 2012). Previous research has shown that those who initiate smoking early have lower first quit attempt rates than those who initiate later (Ershler et al., 1989) and also continue to smoke (Chassin et al., 1996; Griffin et al., 1999; Silva et al., 2006). Because of how dangerous early smoking initiation is, many studies over the years have identified risk factors related to cigarette experimentation and smoking initiation among adolescents (Alexander et al., 2001; Hoffman et al., 2007; Conrad et al., 1992; Tyas and Pederson, 1998). Our group has focused on identifying risk factors for smoking experimentation and initiation among the Mexican heritage population in the United States. We have found that that low to moderate subjective social status combined with holding positive outcome expectations for smoking resulted in higher risk of adolescent experimentation (Wilkinson et al., 2009) and that family conflict is associated with an increased risk for adolescent smoking while family cohesion decreases the risk (Rajesh et al., 2015). Increased levels of

anxiety (Okeke et al., 2013), age, sex, cognitive susceptibility, peer influence, and household smoking behavior were all associated with smoking experimentation as well (Talluri et al., 2014). The relationships of acculturation and birth place to smoking behaviors among Latino is complex (Gorman et al., 2014) and parental education along with family status are also related to children's smoking experimentation and future smoking (Zaloudikova et al., 2012).

These population specific studies are of significance because the Mexican population is the largest Hispanic group in the United States, with a quarter of the population residing within Texas (U.S. Census Bureau, 2011). Due to this population's projected growth, further assessments of the Mexican American adolescent population are needed to better understand their smoking behaviors. To the best of our knowledge, factors associated with escalation, or an individual's transition from just experimentation to a higher intake, have not been studied in adolescent Mexican Americans. Using a population based cohort of Mexican American households in Texas, we analyzed adolescents who had never smoked or had only experimented with cigarettes in 2005–2006 but had escalated to a higher intake by the 2010–2011 follow up (Talluri et al., 2014). This study aims to provide information that can be used in interventions to prevent smoking escalation in this underrepresented and growing population.

2. Methods

2.1. Study population

Participants in this study were recruited from a population based cohort of Mexican American households instituted and maintained by the Department of Epidemiology at The University of Texas M.D. Anderson Cancer Center, called the Mexican American Cohort Study (MACS) (Wilkinson et al., 2005; Chow et al., 2015). In 2005 to 2006, a nested longitudinal cohort within the Mexican American Cohort Study was initiated to study smoking behavior in Mexican American adolescents aged 11 to 13. This cohort became known as the Mexican American Tobacco Use in Children (MATCh). The details of study recruitment and participants' characteristics are given in Wilkinson et al. (Wilkinson et al., 2008) MACS households with at least one boy or girl between the ages of 11 to 13 years were eligible to participate in the study. IRB trained, bilingual interviewers contacted adults in these households via the telephone to explain the goals of the MATCh study and invite the household to participate. Of the 3000 MACS households eligible for the study, 1328 households were successfully recruited. From each household, one child was identified as a participant and a short in-person interview was conducted to obtain informed parental consent and participant assent, as well as demographic and acculturation data. The participants answered the remaining survey questions for this study using a personal digital assistant (PDA). The use of the PDA avoided parental and peer influences on the participants' responses. The baseline and final interviews were conducted in the participants' homes so they would feel more comfortable. A total of 1328 participants took part in the baseline home interviews and surveys from 2005 to 2006. Final home interviews and surveys were conducted from 2010 to 2011 in which 1001 participants took part (Wilkinson et al., 2015).

2.2. Measures

2.2.1. Outcomes

The primary outcome measure of interest in this study was change in smoking status from baseline to follow-up. The Minnesota Smoking Index (Pechacek et al., 1984) is a scale with eleven possible response statements about smoking status; participants select the statement that most closely reflects his or her current smoking status. Adolescents who responded with items "Never tried a cigarette" or "Had one or more puffs in my life, but not a whole cigarette" at baseline were included in this study. At follow-up the survey was taken a second time and

responses to the Minnesota Smoking Index were looked at again. If the participant responded as they did at baseline (i.e. no progression along the smoking continuum), then they were a control, coded as 0, and labeled as stable. If a participant responded differently, by moving up the scale in any way, which reflected increased smoking behavior, then they were cases, coded as 1, and labeled as an escalator.

2.2.2. Predictors

We investigated several demographic and psychosocial variables, all assessed at baseline, to examine their possible roles in changing smoking patterns over time. These demographic predictors included age, sex, birthplace, subjective social status, linguistic acculturation, and parental education. Psychosocial predictors included anxiety, behavioral intentions, peer influence, family influence, family cohesion and conflict, as well as positive and negative outcome expectations.

Subjective social status was examined using the 10-point MacArthur Scale of Subjective Social Status-Youth Version (Goodman et al., 2001). This variable reflects the adolescents' perception of his or her social status relative to fellow students at school. Responses are made on a ladder, where the bottom rung is 1 or the worst ranking, and top rung is 10 or the best ranking.

Linguistic acculturation was assessed using four items that observed whether Spanish or English was the dominant language used, via a language use subscale on Marin et al.'s acculturation measure (Marin et al., 1987). The four items asked what language the participant generally used to read, speak at home, think, and speak with friends. Responses were made on a 5-point Likert scale, ranging from "Only Spanish" to "Only English" (Cronbach's alpha = 0.75). The four responses were averaged to create the measure of linguistic acculturation.

Parental education was used as a proxy measure for socioeconomic status as the overwhelming majority of parents reported on their educational attainment, but not household income. Responses were categorized into three groups: "less than high school," "completed high school" and "more than high school".

Speilberger's trait anxiety scale a reliable and validated measure (Spielberger, 1985), was used to assess anxiety. Participants responded to twenty personal statements about their general emotional state (e.g. "I usually feel calm" and "I usually feel stressed"). Responses were made on a 4-point Likert scale; response options ranged from "Not at all" to "Very much." The anxiety score for each participant was calculated by adding up the responses for all twenty items (Cronbach's alpha = 0.86).

Behavioral intentions were measured using one item that asked "Do you think you will try a cigarette soon?" (Pierce et al., 1996). The responses were collapsed into two categories, "Definitely not" and "Probably not/Probably yes/Definitely yes."

Social influence was assessed using two questions that asked about the smoking behavior of people close to the adolescents (Epstein et al., 1999). The questions were "How many of your friends smoke?" and "How many of your parents' friends smoke?" Responses were made on a 4-point scale ranging from "none" to "all." These responses were collapsed to either "none" or "a few/some/all." Family influence was assessed using five questions asking whether their father, mother, brother, sister, and/or anyone else living in their home smoked (Spelman et al., 2009). The responses were used to calculate the total of smokers in the household and were categorized as "0 individuals," "1 individual," or "2–4 individuals" in the household that smoked.

Family cohesion and conflict were assessed using the Family Life Questionnaire (Rajesh et al., 2015; Foxcroft and Lowe, 1995; Foxcroft and Lowe, 1991; Rajesh, 2011), which has been validated for use in this population (Rajesh et al., 2015). Four items assessed family cohesion (e.g. "In my family we really help and support one another") and four more assessed family conflict (e.g. "We don't often fight in my family"). Responses were made on a 4-point Likert scale with a range of "Strongly Disagree" to "Strongly Agree". Both family cohesion (Cronbach's alpha = 0.65) and conflict variables (Cronbach's alpha =