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Short communication

E-cigarette use and subsequent cigarette and marijuana use among Hispanic young adults

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ABSTRACT

Purpose: Electronic cigarettes (e-cigarettes) could have a multifaceted effect on public health by changing the likelihood that: (a) non-smokers and non-users of marijuana subsequently transition to cigarette and marijuana use, respectively, and/or: (b) cigarette smokers subsequently quit smoking. We analyzed data from a longitudinal study of Hispanic young adults in Los Angeles, California to determine whether e-cigarette use is associated with subsequent cigarette or marijuana use over a one-year period.

Methods: Survey data were collected from 1332 Hispanic young adults (59% female, mean age = 22.7 years, SD = 0.39 years) in 2014 and 2015. Logistic regression analyses examined the association between e-cigarette use in 2014 and cigarette/marijuana use in 2015, controlling for age, sex, and other substance use.

Results: In 2014, prevalence of past-month use was 9% for e-cigarettes, 21% for cigarettes, and 23% for marijuana. Among past-month cigarette nonsmokers in 2014, those who were past-month e-cigarette users in 2014 were over 3 times more likely to be past-month cigarette smokers in 2015, compared with those who did not report past-month e-cigarette use in 2014 (26% vs. 7%; OR = 3.32, 95% CI = 1.55, 7.10). Among past-month marijuana non-users in 2014, those who were past-month e-cigarette users in 2014 were nearly 2 times more likely to be past-month marijuana users in 2015 (24% vs. 12%;OR = 1.97, 95% CI = 1.01, 3.86). Among past-month cigarette and marijuana users in 2014, e-cigarette use in 2014 was not associated with a change cigarette and marijuana use, respectively, in 2015.

Conclusions: Among Hispanic young adults, e-cigarettes could increase the likelihood of transitioning from non-user to user of cigarettes or marijuana and was not associated with smoking cessation.

1. Introduction

Although electronic cigarettes (e-cigarettes) have been promoted as a safer alternative to combustible cigarettes (McNeill et al., 2015), they could adversely affect public health if they increase the likelihood that nonsmokers will begin using cigarettes or other drugs (Alawsi et al., 2015). E-cigarettes are more socially acceptable than combustible cigarettes and could therefore be attractive to people who would ordinarily be deterred by social norms from using combustible cigarettes (Leventhal et al., 2015). Adolescents with a genetic and/or environmental liability to experiment with substance use might begin with e-cigarettes and thereby obtain access to peer groups and social environments that encourage substance use, ultimately leading to experimentation with other substances with more adverse health effects (Vanyukov et al., 2012). Once users experience physiological and social reinforcement from e-cigarette use, they might be more likely to transition to combustible cigarettes (Schneider and Diehl, 2015). Studies of adolescents and young adults have found that cigarette nonsmokers who have used e-cigarettes are at increased risk for progressing to cigarette smoking, relative to those who have not used e-cigarettes (Cardenas et al., 2016; Gmel et al., 2016; Leventhal et al., 2015; Primack et al., 2015; Wills et al., 2016).

Among current cigarette smokers, switching to e-cigarettes could reduce harm if it leads to sustained cessation or reduction of cigarette use. The field has not yet achieved consensus about whether e-cigarettes are effective for combustible cigarette cessation; some studies have shown cessation effects, but others have not (Orr and Asal, 2014). Few studies have examined long-term cessation effects–whether cigarette smokers who switch to e-cigarettes continue to use only e-cigarettes, or whether they become dual users of both combustible cigarettes and e-cigarettes.

It is also possible that e-cigarettes increase the likelihood of using other drugs that can be inhaled or vaped, such as marijuana.

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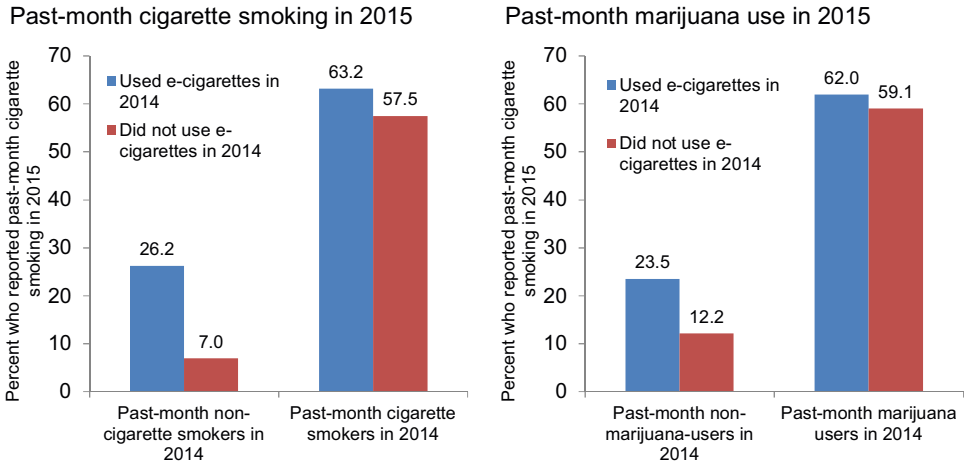

Fig. 1. 2015 Substance use among 2014 e-cigarette users and non-users.

Experimentation with e-cigarettes can provide an opportunity to purchase and learn how to use vaping equipment (e.g., box mods, batteries, chargers, and flavored e-juices), which could facilitate the transition from vaping nicotine to vaping other drugs such as marijuana (Giroud et al., 2015). Vaping nicotine could also introduce people to the pro-vaping culture through vape shops, vaping websites, and social media, which typically are supportive of both nicotine vaping and marijuana vaping (Budney et al., 2015; Gostin and Glasner, 2014). The nicotine in e-cigarettes also might prime brain responses to other drugs (Kandel and Kandel, 2014) (Fig.1).

It is especially important to investigate the impact of e-cigarettes on vulnerable populations including young adults—who currently report the highest prevalence of e-cigarette use (McMillen et al., 2015), and ethnic minorities—who have historically suffered tobacco-related health disparities and are disproportionately exposed to tobacco product marketing (Fagan et al., 2007). Although e-cigarettes were initially most popular among non-Hispanic Whites (King et al., 2013), e-cigarette use among Hispanic adolescents and young adults has increased in recent years (Saddleson et al., 2015) and in some samples has surpassed the rate among Whites (Bostean et al., 2015; Leventhal et al., 2015). If e-cigarettes facilitate progression to habitual cigarette and/or marijuana use, they could exacerbate health disparities among Hispanics.

We analyzed data from a longitudinal study of Hispanic young adults in Los Angeles, California to examine the effects of e-cigarette use on cigarette and marijuana use one year later. We hypothesized that (1) among past-month cigarette nonsmokers, those who used e-cigarettes would be at increased risk of progressing to past-month cigarette smoking in the next year (consistent with the common liability model); (2) among past-month cigarette smokers, those who used e-cigarettes would be less likely to be smoking combustible cigarettes one year later (consistent with the notion that e-cigarettes facilitate smoking cessation). We also examined whether these patterns existed for marijuana use, hypothesizing that (3) among past-month marijuana non-users, those who used e-cigarettes would be at increased risk of becoming past-month marijuana users in the next year (Table 1).

2. Material and methods

Survey data were obtained from 1332 Hispanic young adults who participated in Project RED, a longitudinal study of cultural factors and substance use. Participants were originally recruited when they were 9th-grade students attending Los Angeles area high schools in 2005 and were followed approximately annually through 2015. The data reported in this article is from the 2014 and 2015 surveys, when Project RED added questions about e-cigarette use. Details about the initial recruitment and follow-up are described by Unger (2014). The Project RED young adult panel includes 1445 Hispanic young adults who originally participated in the high school survey. Participants were contacted by email, text message, phone, and/or social media in 2014 and 2015 and invited to complete online surveys. The sample for this analysis included all participants who completed surveys in both 2014 and 2015 (N = 1332, 92% of the young adult panel).

2.1. Measures

Participants' use of combustible cigarettes, e-cigarettes, and marijuana were classified based on their use in the past month (yes/no). Covariates included age, sex, and past-month use of alcohol and other tobacco products (hookah, cigars, little cigars, smokeless tobacco).

2.2. Statistical analysis

The sample was stratified into two groups according to 2014 combustible cigarette use: past-month cigarette nonsmokers and past-month cigarette smokers. Within each group, a logistic regression analysis was conducted to determine the likelihood of being a past-month cigarette smoker in 2015. The main predictor variable was past-month e-cigarette use in 2014. Similarly, the sample was stratified into two groups according to 2014 past-month marijuana use: past-month marijuana users and past-month marijuana nonusers. Within each group, a logistic regression analysis was conducted to determine the likelihood of being a past-month marijuana user in 2015, with past-month e-cigarette use in 2014 as the main predictor.

3. Results

The participants' mean age in 2014 was 22.7 years (SD = 0.39 years). All participants identified as Hispanic, and 59% were female.

3.1. Is e-cigarette use associated with subsequent cigarette use among cigarette nonsmokers?

Among the participants who were past-month cigarette nonsmokers in 2014, (N = 1056, 79% of the sample), 42 (4%) reported past-month e-cigarette use in 2014. Among cigarette nonsmokers who used e-cigarettes in 2014, 26% had become past-month