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Multiple tobacco product use among young adult bar patrons in New Mexico

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ABSTRACT

Introduction. Use of non-cigarette tobacco products is common, and e-cigarette use is increasing among young adults. We aimed to identify use of other tobacco products among young adult bar patrons in the context of a bar-based intervention to decrease cigarette smoking.

Methods. 2291 cross-sectional surveys were collected from young adults in bars in Albuquerque, New Mexico using time–location sampling between 2011 and 2013 (N = 1142 in 2011, N = 1149 in 2012–2013), 2 and 3 years into an intervention to reduce cigarette use, and analyzed in 2014–2015. Participants reported current (i.e. past 30-day) use of cigarettes, snus, dip, cigarillos, hookah, and e-cigarettes, demographics, and tobacco-related attitudes. Multiple imputation was used to account for planned missing data. Logistic regression determined correlates of multiple tobacco product use.

Results. Cigarette smoking in the population decreased during the intervention from 43% to 37%. Over 60% of current cigarette smokers reported poly-use, most frequently with e-cigarettes (46%) and hookah (44%), followed by cigarillos (24%), dip (15%), and snus (14%) in 2012–2013. Among cigarette smokers, current e-cigarette use increased, while use of other products decreased during the intervention. Odds of poly-use (versus smoking cigarettes only) were greater among males and those reporting past 30-day binge drinking, and lower in those who strongly believed secondhand smoke exposure is harmful.

Conclusions. Among young adult bar patrons in Albuquerque, New Mexico, most cigarette smokers reported currently using at least one other tobacco product. Public health interventions should address use of all tobacco products, use of which may rise despite decreased cigarette use.

Introduction

Use of non-cigarette tobacco products (e.g. hookah, cigarillos, and smokeless tobacco) is common (Barnett et al., 2013; Latimer et al., 2014; McMillen et al., 2012; Rath et al., 2012; Richardson et al., 2013) and electronic cigarette (e-cigarette) use (Choi and Forster, 2013; Pearson et al., 2012; Sutfin et al., 2013) is increasing among young adults. Contributing factors include decreased perceived harm (Choi and Forster, 2014; Grekin and Ayna, 2012), appeal of novel products, ability to use in smoke-free environments, targeted advertising (Grana and Ling, 2014), and flavored tobacco products (Villanti et al., 2013).

Most adult cigarette smokers started before age 26 (U.S. Department of Health and Human Services, 2012, 2014). Young adult smoking prevalence remains higher than most age groups, and trends toward decreased smoking have transitioned to stable cigarette initiation rates among this age group (U.S. Department of Health and Human Services, 2012, 2014). Dual- or poly-tobacco product use (i.e. use of cigarettes with one or more other tobacco products) can result from cigarette smokers taking up other tobacco products, or uptake of cigarette smoking by existing users of other tobacco products (Hamari et al., 2013; Latimer et al., 2014; Rath et al., 2012). The proliferation of smoke-free policies and decreasing social acceptability of cigarette smoking, may lead to greater interest in non-cigarette tobacco products due to fewer restrictions on their use, lower taxes or prices, and different perceptions of their risks or benefits (O'Connor, 2012). This is particularly important in young adults, many of whom are developing long-term tobacco use patterns (Ling and Glantz, 2002; Rigotti et al., 2000). In a United States military cohort, smokeless tobacco use resulted in harm escalation, with over 85% going on to dual use rather than switching from cigarettes to smokeless tobacco (Klesges et al., 2010).

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In adults, dual users of smokeless tobacco products and cigarettes intend to quit smoking less often than those using only cigarettes (McClave-Regan and Berkowitz, 2011) and, among those who attempt to quit, dual users tend to succeed less often (Tomar et al., 2010).

Tobacco advertisements and promotional efforts are linked to initiation and continuation of tobacco use (U.S. Department of Health and Services, 2012), and they are common in bars and nightclubs (Katz and Lavack, 2002; Sepe et al., 2002). Recently, promotional activities for alternative tobacco products and e-cigarettes have increased, including messages promoting use in bars and nightclubs (Grana and Ling, 2014). Young adults who attend bars and clubs are at higher risk of future smoking than those who do not (Gilpin et al., 2005), more frequent bar/nightclub attendance has been associated with current smoking (Dietz et al., 2013), and young adults attending bars, even those in states with smokefree bar laws, have high rates of secondhand smoke exposure (Kalkhoran et al., 2013). Many states that have comprehensive smokefree laws, such as New Mexico, do not include e-cigarettes (Marynak et al., 2014).

Prior studies have shown high rates of concurrent tobacco product use in college student cigarette smokers (Latimer et al., 2014) and online samples of young adults (Rath et al., 2012; Soneji et al., 2014), but little is known about use of multiple tobacco products among bar patrons. The objectives of this study were to (1) identify what additional tobacco products young adult bar patrons use with cigarettes, and (2) describe multiple product users.

Methods

Cross-sectional surveys were collected from young adult (aged 18 to 26) patrons of bars and nightclubs in Albuquerque, New Mexico over two periods: March–December 2011 and December 2012–December 2013. Data were collected as part of the evaluation of an intervention to reduce cigarette use among young adult bar patrons, which was implemented in 2009 and targeted the "Partier" peer crowd (Fallin et al., 2015). Participants were enrolled using time–location sampling, a technique previously used to access hard-to-reach populations (Magnani et al., 2005; Muhib et al., 2001; Raymond et al., 2010). Briefly, participants were recruited at randomly selected venues, dates, and times determined to be popular among the target population in interviews with key informants such as bartenders and party promoters. Trained study personnel visited the randomly-selected sites and invited all individuals whose self-reported age was between 18 and 26, who did not appear intoxicated, and were willing and able to provide oral informed consent to complete a paper-and-pencil questionnaire. Participants received a $5 incentive to complete the questionnaire. The study protocol was approved by the Committee for Human Research (the IRB) at the University of California San Francisco.

Inclusion criteria

Participant self-reported ages were validated using date of birth, and only those between 18 and 26 by birthdate were used in analyses. Only participants currently residing in New Mexico were included in the study; participants who reported currently attending college outside of New Mexico were excluded so that the population would be more representative of that of Albuquerque, New Mexico. A total of 2530 participants completed surveys: 1 did not provide a date of birth, 56 were outside of the age range based on date of birth, 182 lived or went to college outside of Albuquerque/New Mexico. Data from the remaining 2291 participants were used in analyses. Overall response rate was 73%.

Measures

Tobacco product and alcohol use patterns

Participants were asked on how many of the previous 30 days they had used each of the following products: cigarettes, snus, dip, Black & Mild or cigarillos, hookah, and e-cigarettes. Those who reported using a product on at least one day during the past 30 days were defined as current users of that product. Multiple tobacco product users (poly-users) were defined as individuals who used cigarettes with at least one other tobacco product, while those who used cigarettes and no other tobacco products during the past 30 days were defined as "cigarette-only users". Participants who used at least one other tobacco product in the past 30 days, but not cigarettes, were defined as non-cigarette tobacco product users. The remaining participants, who endorsed no cigarette or other tobacco product use in the past 30 days, were classified as nonusers.

Current smokers (i.e. those who reported any cigarette use in the past 30 days) were divided into nondaily (smoked on 1–29 of the past 30 days) and daily smokers (smoked on 30 of the past 30 days) (Savoy et al., 2014).

Past year quit attempts were assessed by asking participants whether they had stopped smoking tobacco for one day or longer in the past 12 months because they were trying to quit.

Participants who reported binge drinking (drank at least 5 alcoholic shots or drinks within a few hours) on at least one of the past 30 days were classified as current binge drinkers.

Tobacco-related attitudes

Receptivity to tobacco advertising was assessed by asking, as in prior studies (Gilpin et al., 2007), "Do you think you would use a tobacco promotional item? (ex. wear a t-shirt, use a mug, etc.)" with "yes" being receptive to tobacco advertising.

Support for action against the tobacco industry was assessed with agreement with three statements used in prior studies (Ling et al., 2007, 2009) ("I want to be involved with efforts to get rid of cigarette smoking", "I would like to see the cigarette companies go out of business", and "Taking a stand against smoking is important to me"), measured on a 5-point Likert scale from "not at all" to "a great deal", similar to prior research. Consistent with the prior research, the mean score of the three items was calculated and dichotomized, with a score in the top quartile coded as "strong anti-industry attitude".

Strongly believing that secondhand smoke (SHS) exposure is dangerous was assessed by two questions ("I believe that second-hand tobacco smoke is dangerous to a non-smoker's health" and "Inhaling smoke from someone else's cigarettes harms the health of babies and children"), measured on a 5-point Likert scale from "not at all" to "a great deal". As in prior studies (Kalkhoran et al., 2013; Ling et al., 2009), those who answered with a mean score of 5 were classified as having strong beliefs that SHS is dangerous.

Demographics

Demographics included age (calculated from date of birth and used as a continuous variable in analyses), self-identified race/ethnicity (Caucasian, Hispanic, and Other [African-American, Asian, Pacific Islander/Hawaiian, American Indian/Native Alaskan]), sex (male or female), sexual orientation (straight or LGB [those self-reporting being lesbian, gay, bisexual, or other]), level of education ("high school only or college dropout", "in college", and "college graduate").

Statistical analysis

Imputation of planned missing data

To decrease participant response burden, which is particularly important in the bar/nightclub setting where this study was conducted, the questionnaire used a 3-form planned missing data design (Graham et al., 2006). Specifically, participants completed one of three randomly selected versions of the questionnaire; each version contained a core set of questions that appear on all forms, combined with other questions that appear on only 2 of the 3 forms, with the plan to subsequently impute the missing values. This made use of a longer questionnaire feasible in this setting. By design, approximately one-third of participants were not asked about use of a tobacco promotional item, believing that SHS is dangerous, or use of hookah, snus, cigarillo, or e-cigarettes in 2012–2013 with the plan to impute missing values. Under the missing completely at random (MCAR) assumption, multiple imputation via chained equations (MICE) was used to generate 50 imputed data sets that were used in analyses (White et al., 2011).

Given that the vast majority of missing data in the study are MCAR, the parameter estimates remain unbiased when analyzed following use of multiple imputation (Graham et al., 1996). For any remaining item-by-item missingness within each planned missing data strata, the amount of item missingness was very low (<6% in all cases), so any resulting bias from such missing data was assumed to be very low.

Analyses of multiple tobacco product use

Descriptive analyses were performed and differences in product use between study years were evaluated using univariate logistic regression. Multivariate logistic regression models examined associations of demographic factors, binge drinking, and tobacco-related behaviors and attitudes with (1) poly-use compared to cigarette-only use and (2) other tobacco product use among nonsmokers compared to no tobacco product use among