HHS Public Access

Author manuscript

Addict Behav. Author manuscript; available in PMC 2022 February 01.

Published in final edited form as:

Addict Behav. 2021 February ; 113: 106672. doi:10.1016/j.addbeh.2020.106672.

Associations between alcohol consumption and smoking variables among Latinx daily smokers

Maggie Britton[a], **Jaye L. Derrick**[a], **Justin M. Shepherd**[a], **Sana Haddad**[a], **Lorra Garey**[a], **Andres G. Viana**[a], **Michael J. Zvolensky**[a,b,c,*]

[a]Department of Psychology, University of Houston, 3695 Cullen Blvd, Houston, TX 77204 5022, United States

[b]Department of Behavioral Sciences, University of Texas MD Anderson Cancer Center, Houston, TX, United States

[c]HEALTH Institute, University of Houston, Houston, TX, United States

Abstract

Introduction: Accumulating evidence demonstrates a strong link between alcohol consumption and smoking status among Latinx individuals. However, there is a need to evaluate the cognitive processes and experiences related to quitting smoking among Latinx smokers. The purpose of the current paper was to examine the association between alcohol consumption and smoking expectancies, barriers to cessation, cigarette dependence, quit problems, and intentions and confidence to quit.

Methods: Data were taken from a sample of Spanish-speaking Latinx daily smokers (N = 359; 59% female; M_{age} = 33.20, *SD* = 9.71) who completed an online survey. The alcohol consumption subscale of the Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, & World Health Organization, 2001) was used to predict smoking variables.

Results: Consistent with our prediction, alcohol consumption significantly predicted smoking variables indicative of poorer smoking cessation ability. Specifically, greater alcohol consumption was associated with greater positive and negative smoking expectancies, barriers to cessation, and quit problems experienced during prior cessation attempts. Unexpectedly, greater alcohol consumption was also associated with greater confidence to quit smoking.

*Corresponding author at: Department of Psychology, University of Houston, 3695 Cullen Blvd, Houston, TX 77204 5022, United States. mjzvolen@central.uh.edu (M.J. Zvolensky).

Contributions: Author Maggie Britton contributed to the conceptualization, formal analysis, writing, reviewing, and editing the manuscript as well as manuscript visualization and funding acquisition. Author Jaye L. Derrick contributed to the conceptualization, supervision, writing, reviewing and editing of the manuscript. Author Justin Shepherd contributed to the writing, reviewing, and editing of the manuscript as well as data curation. Author Sana Haddad contributed to the writing, reviewing, and editing of the manuscript as well as visualization. Authors Lorra Garey and Andres Viana contributed to writing, reviewing and editing the manuscript, and author Michael Zvolensky contributed to writing, reviewing and editing the manuscript as well as conceptualization, resources, supervision and funding acquisition

Declaration of Competing Interest

All authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.addbeh.2020.106672.

Conclusions: The current research suggests that alcohol consumption should be considered in the context of smoking cessation among Latinx individuals. The findings confirm and extend previous research by demonstrating that alcohol consumption is associated with proximal predictors of smoking outcomes that can be targeted during treatment. Implications for future research include addressing alcohol consumption during intervention and treatment of Latinx daily smokers.

Keywords

Alcohol consumption; Smoking cessation; Latinx daily smokers

1. Introduction

Cigarette smoking remains the leading preventable cause of death and disability in the United States (U.S.), contributing to over 443,000 deaths each year (CDC, 2008). Although recent years have been marked by a significant decrease in smoking prevalence among the general population in the U.S., reductions in smoking are not uniformly experienced by all groups. For example, while the proportion of non-Hispanic or Latino/a (hereafter, Latinx) White smokers decreased from 2000 to 2017, the proportion of Latinx smokers increased from 8.4% to 11.3% in the same period (U.S. Department of Health and Human Services, 2020). Most (67.4%) Latinx smokers want to quit (Babb, Malarcher, Schauer, Asman, & Jamal, 2017) and 94.3% express some interest in smoking cessation programs (Cox, Cupertino, & Tercyak, 2011). Yet, Latinx individuals are less likely than non-Latinx White individuals to be asked about their tobacco use or be advised on quitting during a healthcare encounter (Cokkinides, Halpern, Barbeau, Ward, & Thun, 2008; Levinson, Pérez-Stable, Espinoza, Flores, & Byers, 2004). Furthermore, cessation treatment utilization rates and long-term benefits of treatment remain low among Latinx smokers (Levinson et al., 2004; Webb, Rodríguez-Esquivel, & Baker, 2010). These systemic challenges culminate in greater quit difficulty among Latinx smokers, as evinced by lower quit rates (Stahre, Okuyemi, Joseph, & Fu, 2010; Trinidad, Pérez-Stable, White, Emery, & Messer, 2011). This lack of clinical uptake and intervention response among Latinx smokers might be related to limited scientific understanding of the factors that interfere with successful smoking cessation among this group (Castro, 2016).

Emerging evidence has identified alcohol consumption as a robust determinant of smoking behavior among Latinx persons. Latinx individuals who report more alcohol use are 2.94 times as likely to be a smoker than those who do not report alcohol use (Cox, Feng, Cañar, Ford, & Tercyak, 2005). Furthermore, Latinx smokers report more drinks per week (Rodníguez-Esquivel, Cooper, Blow, & Resor, 2009) and greater (3.1×) rates of binge drinking (Woolard et al., 2015) compared with Latinx non-smokers. Although this research provides strong initial support for the association between alcohol and smoking status, it has largely overlooked the potential to examine alcohol in a more nuanced framework (Baker et al., 2011; Prochaska & Velicer, 1997).

It is imperative to consider the cognitive processes and experiences predominant in cognitive-behavioral models of addiction (Baker, Piper, McCarthy, Majeskie, & Fiore, 2004;

Niaura, 2000) that underpin alcohol-smoking relations. Extant research among mostly non-Latinx White participants demonstrates a strong association between alcohol consumption and cigarette urge and craving (Burton & Tiffany, 1997; King & Epstein, 2005). Furthermore, alcohol consumption strengthens the rewarding effects of nicotine, including reducing cravings, increasing smoking satisfaction, and increasing the subjective stimulant and calming effects of nicotine (Perkins, 1997; Rose et al., 2004). Qualitative data also suggests that smokers are acutely aware of nicotine's 'sobering' effect when intoxicated, and this effect even motivates use (Nichter, Nichter, Carkoglu, & Lloyd-Richardson, 2010). Taken together, these findings suggest that cigarette use is motivated by alcohol consumption, in part due to the actual and expected effects of nicotine.

In addition to established alcohol-smoking motivational processes, a large body of work supports a strong relationship between alcohol consumption and quit difficulties, albeit largely among non-Latinx White smokers. Alcohol consumption is consistently associated with failure to achieve smoking cessation milestones and with continued smoking (Hughes & Kalman, 2006; Humfleet, Muñoz, Sees, Reus, & Hall, 1999; Kahler et al., 2009). Although alcohol consumption is strongly associated with rates of quitting, perceived barriers to cessation and past quit difficulties have not been examined as perpetuators of this relationship for Latinx smokers. Furthermore, nicotine dependence is posited to be culpable for smokers' quit difficulties, yet the literature on alcohol consumption and nicotine or cigarette dependence presents mixed findings (Cook et al., 2012; Gubner et al., 2016). Unfortunately, the development of interventions for Latinx smokers has relied heavily on this research with non-Latinx White smokers. Thus, it is unclear the extent to which these findings generalize to Latinx smokers (Castro, 2016; Lawrence, Graber, Mills, Meissner, & Warnecke, 2003). As this work continues to evolve, research is needed to confirm factors relevant to Latinx smokers that may be centrally related to smoking and can be targeted in treatment.

Therefore, the current study examined the influence of alcohol consumption on cognitive processes and experiences related to quitting smoking. Based on previous findings, we hypothesized that more alcohol consumption would be associated with greater smoking expectancies, more perceived barriers to cessation, and greater severity of problems experienced when attempting to quit. We tested whether alcohol consumption was associated with cigarette dependence, but given previously mixed findings, we did not have a priori hypotheses about these associations. We also explored whether alcohol consumption was related to intentions and confidence to reduce consumption or quit smoking; these variables have been largely overlooked in the current literature, potentially because many smoking studies that report alcohol use are situated in the context of a current quit attempt.

2. Methods

2.1. Participants

Participants were 359 (59% female; M_{age} = 33.20, *SD* = 9.71) Spanish-speaking Latinx daily smokers. The inclusion criteria included being a daily smoker between 18 and 64 years old, identifying as Latinx, speaking Spanish, and being able to provide informed, voluntary, written consent to participate. Interested participants were excluded if they did not meet all

inclusion criteria. Additional participants (n = 14) were excluded based on data quality checks (see supplementary material, Fig. 1).

Mexico was the most commonly reported national origin (35.38%), followed by the U.S. (22.84%), Puerto Rico (17.55%), Cuba (8.91%), South America (8.08%), Central America (2.79%), the Dominican Republic (2.23%), or Europe (0.84%), and 1.40% reported a mixed or different national origin. One-third of the sample (32.59%) reported living in the U.S. for 10 years or fewer, 18.11% lived in the U.S. for 11–20 years, and almost half (49.30%) lived in the U.S. for 21+ years. Over half of the sample reported at least a high school education (58.22%) and the median income was between 35,000 and 50,000 USD. This sample is fairly representative of the U.S. Latinx population (2019b;; Pew Research Center, 2019a).

2.2. Procedures

Participants were recruited in the U.S. using Qualtrics, an online survey management system that yields valid and reliable representative data (Hauser & Schwarz, 2016; Heen, Lieberman, & Miethe, 2014). Adults from across 32 U.S. states with a Qualtrics panel account who reported a Latinx background, Spanish as their primary language, current daily smoking, and past-week tobacco use were sent a study advertisement to be screened for further eligibility. After a brief survey-based screening, eligible participants were directed to the online anonymous survey. Informed consent was provided prior to access of the survey, which was estimated to take approximately 30 min to complete. Participants could opt to receive the equivalent of $7.50 in compensation for the study in varying forms (e.g., cash-based incentives [i.e., gift cards], rewards miles, rewards points). To ensure valid responses, a speeding check was included - one-half the median survey completion time – to screen out those who were not responding thoughtfully. Furthermore, Qualtrics implements safeguards to prevent multiple attempts to complete the survey by the same respondent (i.e., recording IP addresses and the ‘Prevent Ballot Box Stuffing’ option). The study protocol was approved by the Institutional Review Board at the sponsoring institution.

2.3. Measures

2.3.1. Demographics—Participants provided socio-demographic information including gender, national origin, age, number of years living in the U.S., educational level (1 = 6 years or less, 4 = 12 + years), and annual income (1 = $0-$4,999, 9 = $100,000+). Gender, years in the U.S., education, and income were included as demographic covariates based on demonstrated relevance for Latinx smokers (see Castro, 2016).

2.3.2. Number of medical conditions—The Medical History and Present Medical Condition Questionnaire (Precision Nutrition, 2012) was used to assess number of medical conditions. Participants were asked to indicate whether they had in the past, or currently had, any of the following conditions: heart disease, high blood pressure, diabetes, respiratory disease, gastrointestinal disease, peripheral arterial disease, musculoskeletal disease, headache, genitourinary disease, anemia, oral disease, and pregnancy. This measure has been used in prior work with Spanish-speaking Latinx smokers (Zvolensky, Bakhshaie, Shepherd, Garey, et al., 2019; Zvolensky, Bakhshaie, Shepherd, Peraza, et al., 2019). The number of

conditions was summed to create final scores ranging from 0 to 12, with higher scores indicating a greater number of medical conditions.

2.3.3. Drug Abuse/Dependence Screener—The Drug Abuse/Dependence Screener (Rost, Burnam, & Smith, 1993) is a 3-item measure of commonly abused substances (e.g. cannabis, stimulants, sedatives, tranquilizers). The measure has been used among Spanish speakers in prior work (Watkins, Paddock, Zhang, & Wells, 2006). The answer to the question "Have you ever used one of these drugs on your own more than 5 times in your life?" was used as an index of non-alcohol drug use (0 = no, 1 = yes).

2.3.4. Alcohol consumption—Alcohol consumption was assessed using the consumption subscale of the Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, & World Health Organization, 2001). This 3-item subscale assessed participants' frequency (e.g., "How often do you have a drink containing alcohol") and quantity (e.g., "How many units of alcohol do you drink on a typical day when you are drinking") of alcohol use. Each item was scored using a 4-point Likert scale with varying endpoints and summed to create final scores that range from 0 to 12, with higher scores indicating greater alcohol consumption ($\alpha = 0.81$).

2.3.5. Smoking expectancies—We assessed smoking expectancies using the 21-item Smoking Consequences Questionnaire-Short Form (SCQ-S; Myers et al., 2003). Participants responded to each item using a 10-point Likert scale (0 = completely unlikely, 9 = complete likely). There are four subscales of consequences: negative consequences (e.g., "Smoking is hazardous to my health"; range = 0–36; $\alpha = 0.86$), positive reinforcement (e.g., "I will enjoy the flavor of a cigarette"; range = 0–45; $\alpha = 0.84$), negative reinforcement (e.g., "Cigarettes help me reduce or handle tension"; range = 0–63; $\alpha = 0.86$), and appetitive-weight control (e.g., "Smoking helps me control my weight"; range = 0–4; $\alpha = 0.87$). Higher scores on each subscale reflect greater smoking expectancies.

2.3.6. Barriers to cessation—The Barriers to Cessation Scale (BCS; Macnee & Talsma, 1995) is a 19-item self-report measure of perceived cognitive-affective barriers to (e.g., "Feeling less in control of your moods") or stressors (e.g., "Lack of understanding from family and significant others about what it is like to quit smoking") resulting from smoking cessation. Responses are rated on a 4-point Likert scale (0 = not a barrier, 3 = large barrier). The BCS has demonstrated strong psychometric properties (Garey et al., 2017) and has been used sucessfully among Spanish-speaking samples (Zvolensky et al., 2019a). Scores ranged from 0 to 57, with higher scores indicating greater perceived barriers to cessation ($\alpha = 0.95$).

2.3.7. Cigarette dependence—Cigarette dependence was assessed using the Fagerström Test for Cigarette Dependence (Fagerström, 2011). Participants responded to 6-items (e.g., "How soon after you wake up do you smoke your first cigarette?"). As in past work (Korte, Capron, Zvolensky, & Schmidt, 2013), items 2, 5, and 6 were scored on a 4-point Likert scale (0 = never, 3 = always). Scores ranged from 0 to 16, with higher scores indicating greater cigarette dependence ($\alpha = 0.64$)

2.3.8. Past quit problems—The Smoking History Questionnaire (SHQ) was used to assess years of daily smoking, number of past quit attempts, and number of physical and mental health-related problems experienced during quit attempts (Brown, Lejuez, Kahler, & Strong, 2002). Participants are asked to indicate whether they have experienced (0 = no, 1 = yes) 17 physical and mental health problems (e.g., weight gain, fatigue, headaches, irritability) while trying to quit smoking. The SHQ has been used successfully with Spanish-speaking samples (Zvolensky et al., 2019b). Responses to all items are summed for a final quit problems score ranging from 0 to 17, with higher scores indicating more problems experienced during past quit attempts ($\alpha = 0.95$).

2.3.9. Smoking intentions and confidence—Participants were asked five questions to assess intentions to reduce or quit smoking (three questions) and their confidence to make these changes (two questions). To assess intentions to reduce smoking, participants were asked, “Do you intend to reduce your consumption?” (0 = no, 1 = yes; Falomir & Invernizzi, 1999). We also assessed intentions to quit smoking (0 = no, 1 = yes) in the next 30 days (Dietz, Delva, Woolley, & Russello, 2008) and 6 months (Sansone et al., 2012).

To assess confidence to modify smoking, participants were asked to report how confident they felt that they could reduce or limit their smoking in certain situations, or completely, in the next two months (DiClemente, Prochaska, & Gibertini, 1985). Participants were also asked to report on their quitting self-efficacy (i.e., “How confident are you that you could quit smoking if you wanted to?”; Harris et al., 2016; Niaura et al., 1998; Shadel & Cervone, 2006). Both items were assessed using a 5-point Likert scale (1 = not at all, 5 = extremely).

2.4. Data analysis

Data were analyzed using a series of linear and logistic regressions with robust standard errors in Stata 14 (StataCorp, 2015). Continuous predictor variables were mean centered prior to analysis. Binary predictors were left uncentered. For all analyses, we included gender[1], income, education, number of years in the U.S., number of medical conditions, non-alcohol drug use, number of years a smoker, and number of past quit attempts, as covariates. To include the total effect of gender, we included dummy codes for male and female, with transgender serving as the reference group (Cohen, West, & Aiken, 2003; Hardy, 1993). We utilized the Holm-Bonferroni Method to control for familywise error rates (Holm, 1979). Accordingly, we first ordered the 12 *p* values (smallest to largest) for alcohol consumption. Then, we compared the smallest *p* value to the most stringent adjusted alpha (0.05/12 = 0.0042). Next, we compared the second smallest *p* value to the second most stringent adjusted alpha (0.05/11 = 0.0045). We continued this process until our first failure to reject the null hypothesis (i.e., positive reinforcement). All outcomes that followed were deemed not statistically significant. The adjusted alpha levels are included in Tables 2–4 in their respective columns.

[1]We entered two-way Gender X Alcohol Consumption interactions (N=357 after dropping n=2 transgender participants) into the model for all outcomes. The interaction emerged as significant for only one outcome (i.e., smoking self-efficacy) and did not meet the adjusted alpha cutoff using the Holm-Bonferroni Method to control for familywise error rates (Holm, 1979). Thus, we omitted these interactions from the presented analyses.

3. Results

3.1. Descriptive statistics

On average, participants scored a 4.71 (SD = 3.19) on the alcohol consumption subscale of the AUDIT, which places this sample above the threshold for problematic drinking. Slightly more men (71.92%) than women (65.88%) scored above the respective threshold (4 and 3, respectively). The average participant had smoked for 11.36 years (SD = 9.72, range 1–47) and reported just over 4 past quit attempts (M = 4.15, SD = 6.41). Participants averaged a score of 7.57 (SD = 3.50) out of 16 on cigarette dependence, which is indicative of a moderate level of dependence. Participants also reported about two medical conditions (M = 2.05, SD = 2.60) on average, and almost half of participants reported some non-alcohol drug use (n = 177, 49%) (see Table 1).

3.2. Regression analyses

First, we examined alcohol consumption as a predictor of smoking expectancies (Table 2). After controlling for covariates, alcohol consumption was significantly associated with negative consequences (F [10, 348] = 6.17, p < .001; R^2 = 0.13), negative reinforcement (F[10, 348] = 7.63, p < .001; R^2 = 0.15), and appetitive-weight control (F[10, 348] = 5.52, p < .001; R^2 = 0.13). Smokers who reported more alcohol consumption also expected that smoking would result in greater negative consequences, help mitigate negative affect, and control appetite and weight. Alcohol consumption was not significantly associated with positive reinforcement.

Next, we examined whether alcohol consumption was associated with smokers' perceived barriers to cessation, cigarette dependence, and past problems experienced while trying to quit (Table 3). After controlling for covariates, alcohol consumption was significantly associated with barriers to cessation (F[10, 348] = 9.03, p < .001; R^2 = 0.20) and past quit problems (F[10, 348] = 14.21, p < .001; R^2 = 0.20). Smokers who reported more alcohol consumption also reported greater perceived barriers to cessation and experienced more problems while attempting to quit. Alcohol consumption was not significantly associated with cigarette dependence.

Last, we examined whether alcohol consumption was associated with smokers' intentions and confidence to quit or reduce their smoking (Table 4). After controlling for covariates, alcohol consumption was not significantly associated with intentions to reduce smoking, quit within the next 30 days or 6 months, or with quitting self-efficacy. Unexpectedly, more alcohol consumption was significantly associated with greater confidence to reduce smoking (F[10, 348] = 4.48, p < .001; R^2 = 0.12).

4. Discussion

This investigation examined the impact of alcohol consumption on several smoking processes implicated in cigarette addiction and quit difficulty among a national sample of Latinx adult daily smokers. The findings suggested that Latinx daily smokers who report higher alcohol consumption also report cognitive processes and experiences that would make it harder to quit smoking, even after controlling for theoretically-relevant covariates.

Whereas previous studies have demonstrated a relationship between alcohol and smoking among Latinx individuals (e.g., Cox et al., 2005; Rodríguez-Esquivel et al., 2009; Woolard et al., 2015), this investigation extends the literature by identifying processes that may underpin and strengthen these associations.

Past research with non-Latinx White smokers has shown that people who consume alcohol report feeling a calming effect of cigarettes (Nichter et al., 2010), in addition to experiencing increased pleasure and decreased punishment from smoking (Piasecki et al., 2011). Largely consistent with this observation, we found that alcohol consumption was associated with both positve (e.g., smoking [elevates mood /helps maintain weight]) and negative (e.g., smoking impacts health) expected effects of smoking. These findings add to existing research that alcohol consumption is related to stronger expectancies among Latinx daily smokers (Zvolensky, Bakhshaie, Shepherd, Garey, et al., 2019; Zvolensky et al., 2019b), thereby further ensuring the generalizability of existing smoking cessation determinants to Latinx smokers (Castro, 2016).

Less well-studied is how alcohol consumption might influence barriers to quitting smoking and severity of problems experienced during the past quit attempt. Some past research has reported non-significant associations between alcohol consumption and perceived barriers to quitting among non-Latinx White smokers (Asher et al., 2003; Zvolensky et al., 2007). However, we found that for Latinx smokers, alcohol consumption was associated with an increase in perceived barriers to quitting, as well as an increase in the number of problems reported during past quit attempts. Coupled with the knowledge that Latinx smokers experience increased difficulties with quitting (Stahre et al., 2010; Trinidad et al., 2011), our findings suggest that alcohol use among Latinx smokers may increase susceptibility to the problems associated with initial and maintained abstinence.

We did not find consistent associations between alcohol consumption and intentions or confidence to reduce or quit smoking. Unexpectedly, greater alcohol consumption was significantly associated with greater confidence to reduce smoking in this sample. This finding may suggest a distorted perception of quit difficulty among Latinx smokers that may be perpetuated by lack of intervention by healthcare professionals (Cokkinides et al., 2008; Levinson et al., 2004). Guidelines to enhance confidence to quit smoking center around discussions with a healthcare provider (Fiore, Jaen, Baker, Bailey, Benowitz, & Curry, 2008). Therefore, Latinx smokers may not recognize the unique quit challenges that may result from alcohol-smoking co-use, which may consequently lead to an inflated sense of confidence in quitting. This underscores the importance of increasing provider intervention among Latinx smokers. However, this finding should be interpreted with caution, especially given that we did not find a similar association for quitting self-efficacy.

The current findings support that the consideration of alcohol consumption has the potential to accelerate theoretical models of the quit process among Latinx smokers and will have direct clinical implications for developing culturally appropriate and tailored cessation treatments for this population (NIAAA, 2007). Indeed, addressing the role of alcohol on maladaptive smoking cognitions and perceived barriers to cessation, as well as evaluating experiences with preivous quit attempts, might help to increase the cessation rates among

Latinx smokers. Preliminary culturally-tailored smoking cessation clinical trials that have incorporated alcohol reduction components for Latinx individuals have produced promising results (Correa-Fernández et al., 2017). Indeed, using motivational interviewing (Correa-Fernández et al., 2017) and mindfulness strategies (Vinci, Malkhasyan, Simmons, & Correa-Fernandez, 2020) to reduce alcohol consumption might improve smoking outcomes among Latinx smokers.

Limitations of the current study warrant brief comment. First, these data were collected cross-sectionally. Thus, temporality cannot be determined based on the present data. Future research should consider the use of multiple timepoints to establish causality. Second, these data were pulled from a 30-minute Qualtrics panels study not expressly designed to test the present hypotheses. Thus, there are limitations with the way variables were assessed, relative to our analyses. Third, Latinx individuals are a heterogenous group and demonstrate different smoking rates based on their country of origin; Puerto Ricans and Cubans having the highest rates of smoking (Kaplan et al., 2014), thus future studies might benefit from oversampling these less represented Latinx sub-groups. Finally, we did not assess culturally relevant variables, such as acculturation. In addition to understanding the generalizability of the current state of research to Latinx persons, it is important for future research to consider culturally-relevant variables (Castro, 2016).

The present study provides empirical evidence that alcohol consumption is associated with smoking variables indicating poorer smoking cessation ability among Latinx daily smokers. Such findings bolster the generalizability of known determinants of smoking cessation to Latinx smokers, as well as offer new evidence of the challenge alcohol consumption may present to Latinx smokers when attempting to quit.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Role of Funding Sources: Research reported in this publication was supported by the State of Texas through the Hugh Roy and Lillie Cranz Distinguished University Professor endowment awarded to Michael J. Zvolensky and by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) of the National Institutes of Health under award number F31AA027159. The content is solely the responsibility of the authors and does not necessarily represent the official views of the State of Texas or the National Institutes of Health.

Funding

Research reported in this publication was supported by the State of Texas through the Hugh Roy and Lillie Cranz Distinguished University Professor endowment awarded to Michael J. Zvolensky and by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) of the National Institutes of Health under award number F31AA027159. The content is solely the responsibility of the authors and does not necessarily represent the official views of the State of Texas or the National Institutes of Health.

References

Asher MK, Martin RA, Rohsenow DJ, MacKinnon SV, Traficante R, & Monti PM (2003). Perceived barriers to quitting smoking among alcohol dependent patients in treatment. Journal of Substance Abuse Treatment, 24(2),169–174. 10.1016/S0740-5472(02)00354-9 [PubMed: 12745034]

Babb S, Malarcher A, Schauer G, Asman K, & Jamal A (2017). Quitting Smoking Among Adults — United States, 2000–2015. Morbidity and Mortality Weekly Report (MMWR), 65, 1457–1464. 10.15585/mmwr.mm6552a1 [PubMed: 28056007]

Baker TB, Mermelstein R, Collins LM, Piper ME, Jorenby DE, Smith SS, … Fiore MC (2011). New methods for tobacco dependence treatment research. Annals of Behavioral Medicine, 41(2), 192–207. 10.1007/s12160-010-9252-y [PubMed: 21128037]

Baker TB, Piper ME, McCarthy DE, Majeskie MR, & Fiore MC (2004). Addiction motivation reformulated: An affective processing model of negative reinforcement. Psychological Review, 111(1), 33–51. 10.1037/0033-295X.111.1.33 [PubMed: 14756584]

Brown RA, Lejuez CW, Kahler CW, & Strong DR (2002). Distress tolerance and duration of past smoking cessation attempts. Journal of Abnormal Psychology, 111(1), 180–185. 10.1037/0021-843X.111.1.180 [PubMed: 11866171]

Burton SM, & Tiffany ST (1997). The effect of alcohol consumption on craving to smoke. Addiction, 92(1), 15–26. https://doi.Org/10.1111/j.1360-0443.1997.tb03634.x [PubMed: 9060194]

Castro Y (2016). Determinants of smoking and cessation among Latinos: Challenges and implications for research: determinants of smoking and cessation among Latinos. Social and Personality Psychology Compass, 10(7), 390–404. 10.1111/spc3.12256 [PubMed: 27672402]

CDC. (2008). Annual smoking—attributable mortality, years of potential life lost, and productivity losses—United States, 2000–2004. MMWR Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5745a3.htm.

Cohen P, West SG, & Aiken LS (2003). Applied multiple regression/ correlation analysis for the behavioral sciences. New York, NY: Psychology Press.

Cokkinides VE, Halpern MT, Barbeau EM, Ward E, & Thun MJ (2008). Racial and ethnic disparities in smoking-cessation interventions. American Journal of Preventive Medicine, 34(5), 404–412. 10.1016/j.amepre.2008.02.003 [PubMed: 18407007]

Cook JW, Fucito LM, Piasecki TM, Piper ME, Schlam TR, Berg KM, & Baker TB (2012). Relations of alcohol consumption with smoking cessation milestones and tobacco dependence. Journal of Consulting and Clinical Psychology, 80 (6), 1075–1085. 10.1037/a0029931 [PubMed: 22963593]

Correa-Fernandez V, Diaz-Toro EC, Reitzel LR, Guo L, Chen M, Li Y, … Wetter DW (2017). Combined treatment for at-risk drinking and smoking cessation among Puerto Ricans: A randomized clinical trial. Addictive Behaviors, 65, 185–192. 10.1016/j.addbeh.2016.10.009 [PubMed: 27825036]

Cox LS, Cupertino AP, & Tercyak KP (2011). Interest in participating in smoking cessation treatment among Latino primary care patients. Journal of Clinical Psychology in Medical Settings, 18(4), 392–399. 10.1007/s10880-011-9259-y [PubMed: 21984387]

Cox LS, Feng S, Canar J, Ford MM, & Tercyak KP (2005). Social and behavioral correlates of cigarette smoking among mid-Atlantic Latino primary care patients. Cancer Epidemiology Biomarkers & Prevention, 14(8), 1976–1980. 10.1158/1055-9965.Epi-05-0141

DiClemente CC, Prochaska JO, & Gibertini M (1985). Self-efficacy and the stages of self-change of smoking. Cognitive Therapy and Research, 9(2), 181–200. 10.1007/BF01204849

Dietz NA, Delva J, Woolley ME, & Russello L (2008). The reach of a youth-oriented anti-tobacco media campaign on adult smokers. Drug and Alcohol Dependence, 93(1–2), 180–184. 10.1016/j.drugalcdep.2007.08.019 [PubMed: 17964081]

Fagerstrom K (2011). Determinants of tobacco use and renaming the FTND to the Fagerstrom test for cigarette dependence. Nicotine & Tobacco Research, 14(1), 75–78. 10.1093/ntr/ntr137 %J Nicotine & Tobacco Research [PubMed: 22025545]

Falomir JM, & Invernizzi F (1999). The role of social influence and smoker identity in resistance to smoking cessation. Swiss Journal of Psychology / Schweizerische Zeitschdftfiir Psychologie / Revue Suisse de Psychologie, 58(2), 73–84. 10.1024//1421-0185.58.2.73

Fiore MC, Jaen CR, Baker TB, Bailey WC, Benowitz NL, Curry SJ, & et al. (2008). Treating tobacco use and dependence: 2008 update Clinical Practice Guideline (Report Number, 5). Rockville, MD.

Garey L, Jardin C, Kauffman BY, Sharp C, Neighbors C, Schmidt NB, & Zvolensky MJ (2017). Psychometric evaluation of the Barriers to Cessation Scale. Psychological Assessment, 29(7), 844–856. 10.1037/pas0000379 [PubMed: 27736128]

Greenland S, Mansournia MA, & Altman DG (2016). Sparse data bias: A problem hiding in plain sight. BMJ, 352, Article i1981 10.1136/bmj.i1981%JBMJ [PubMed: 27121591]

Gubner NR, Kozar-Konieczna A, Szoltysek-Boldys I, Slodczyk-Mankowska E, Goniewicz J, Sobczak A, … Goniewicz ML (2016). Cessation of alcohol consumption decreases rate of nicotine metabolism in male alcohol-dependent smokers. Drug and Alcohol Dependence, 163, 157–164. 10.1016/j.drugalcdep.2016.04.006 [PubMed: 27107849]

Hardy MA (1993). Regression with dummy variables (Vol. 93). Thousand Oaks, CA: Sage DOI:10.4135/9781412985628.

Harris KJ, Bradley-Ewing A, Goggin K, Richter KP, Patten C, Williams K, … Catley D (2016). Recruiting unmotivated smokers into a smoking induction trial. Health Education Research, 31(3), 363–374. [PubMed: 27081187]

Hauser DJ, & Schwarz N (2016). Attentive Turkers: MTurk participants perform better on online attention checks than do subject pool participants. Behavior Research Methods, 48(1), 400–407. 10.3758/s13428-015-0578-z [PubMed: 25761395]

Heen MS, Lieberman JD, & Miethe TD (2014). A comparison of different online sampling approaches for generating national samples.

Holm S (1979). A simple sequentially rejective multiple test procedure. Retrieved from www.jstor.org/stable/4615733. Scandinavian Journal of Statistics, 6(2), 65–70

Hughes JR, & Kalman D (2006). Do smokers with alcohol problems have more difficulty quitting? Drug and Alcohol Dependence, 82(2), 91–102. 10.1016/j.drugalcdep.2005.08.018 [PubMed: 16188401]

Humfleet G, Munoz R, Sees K, Reus V, & Hall S (1999). History of alcohol or drug problems, current use of alcohol or marijuana, and success in quitting smoking. Addictive Behaviors, 24(1), 149–154. 10.1016/S0306-4603(98)00057-4 [PubMed: 10189984]

Kahler CW, Borland R, Hyland A, McKee SA, Thompson ME, & Cummings KM (2009). Alcohol consumption and quitting smoking in the International Tobacco Control (ITC) Four Country Survey. Drug and Alcohol Dependence, 100(3), 214–220. 10.1016/j.drugalcdep.2008.10.006 [PubMed: 19056188]

Kaplan RC, Bangdiwala SI, Barnhart JM, Castaneda SF, Gellman MD, Lee DJ, … Giachello AL (2014). Smoking Among U.S. Hispanic/Latino Adults. American Journal of Preventive Medicine, 46(5), 496–506. 10.1016/j.amepre.2014.01.014 [PubMed: 24745640]

King AC, & Epstein AM (2005). Alcohol dose-dependent increases in smoking urge in light smokers. Alcoholism: Clinical and Experimental Research, 29(4), 547–552. 10.1097/01.ALC.0000158839.65251.FE

Korte KJ, Capron DW, Zvolensky M, & Schmidt NB (2013). The Fagerstrom Test for Nicotine Dependence: Do revisions in the item scoring enhance the psychometric properties? Addictive Behaviors, 38(3), 1757–1763. 10.1016/j.addbeh.2012.10.013 [PubMed: 23254226]

Lawrence D, Graber JE, Mills SL, Meissner HI, & Warnecke R (2003). Smoking cessation interventions in U.S. racial/ethnic minority populations: An assessment of the literature/o/This research was initiated and funded by The National Cancer Institute. Preventive Medicine, 36(2), 204–216. 10.1016/S0091-7435(02)00023-3 [PubMed: 12590996]

Levinson AH, Pérez-Stable EJ, Espinoza P, Flores ET, & Byers TE (2004). Latinos report less use of pharmaceutical aids when trying to quit smoking. American Journal of Preventive Medicine, 26(2), 105–111. 10.1016/j.amepre.2003.10.012 [PubMed: 14751320]

Macnee CL, & Talsma A (1995). Development and testing of the barriers to cessation scale. Nursing Research, 44(4), 214–219. 10.1097/00006199-199507000-00005 [PubMed: 7624231]

NIAAA. (2007). Alcohol and Tobacco. Retrieved from https://pubs.niaaa.nih.gov/publications/aa71/aa71.htm.

Niaura R (2000). Cognitive social learning and related perspectives on drug craving. Addiction, 95(8s2), 155–163. 10.1046/j.1360-0443.95.8s2.4.x

Niaura R, Shadel WG, Abrams DB, Monti PM, Rohsenow DJ, & Sirota A (1998). Individual differences in cue reactivity among smokers trying to quit: Effects of gender and cue type. Addictive Behaviors, 23(2), 209–224. 10.1016/S0306-4603(97)00043-9 [PubMed: 9573425]

Nichter M, Nichter M, Carkoglu A, & Lloyd-Richardson E (2010). Smoking and drinking among college students: "It's a package deal". Drug and Alcohol Dependence, 106(1), 16–20. 10.1016/j.drugalcdep.2009.07.025 [PubMed: 19758771]

Perkins KA (1997). Combined effects of nicotine and alcohol on subjective, behavioral and physiological responses in humans. Addiction Biology, 2(3), 255–268. 10.1080/13556219772552 [PubMed: 26735782]

Pew Research Center. (2019a). Facts on Latinos in the U.S Retrieved from https://www.pewresearch.org/hispanic/fact-sheet/latinos-in-the-u-s-fact-sheet.

Pew Research Center. (2019b). Key facts about U.S. Hispanics and their diverse heritage. Retrieved from https://www.pewresearch.org/fact-tank/2019/09/16/key-facts-about-u-s-hispanics/.

Piasecki TM, Jahng S, Wood PK, Robertson BM, Epler AJ, Cronk NJ, … Sher KJ (2011). The subjective effects of alcohol-tobacco co-use: an ecological momentary assessment investigation. Journal of abnormal psychology, 120(3), 557–571. 10.1037/a0023033 [PubMed: 21443289]

Prochaska JO, & Velicer WF (1997). The transtheoretical model of health behavior change. American Journal of Health Promotion, 12(1), 38–48. [PubMed: 10170434]

Rodríguez-Esquivel D, Cooper TV, Blow J, & Resor MR (2009). Characteristics associated with smoking in a Hispanic sample. Addictive Behaviors, 34(6–7), 593–598. 10.1016/j.addbeh.2009.03.030 [PubMed: 19394148]

Rose JE, Brauer LH, Behm FM, Cramblett M, Calkins K, & Lawhon D (2004). Psychopharmacological interactions between nicotine and ethanol. Nicotine & Tobacco Research, 6(1), 133–144. 10.1080/14622200310001656957 [PubMed: 14982697]

Rost K, Burnam MA, & Smith GR (1993). Development of screeners for depressive disorders and substance disorder history. Retrieved from Medical Care, 31(3), 189–200 www.jstor.org/stable/3765814.

Sansone GC, Raute LJ, Fong GT, Pednekar MS, Quah ACK, Bansal-Travers M, … Sinha DN (2012). Knowledge of health effects and intentions to quit among smokers in India: Findings from the tobacco control policy (TCP) India Pilot Survey. International Journal of Environmental Research and Public Health, 9(2). 10.3390/ijerph9020564

Shadel WG, & Cervone D (2006). Evaluating social-cognitive mechanisms that regulate self-efficacy in response to provocative smoking cues: An experimental investigation. Psychology of Addictive Behaviors, 20(1), 91–96. 10.1037/0893-164X.20.1.91 [PubMed: 16536671]

Stahre M, Okuyemi KS, Joseph AM, & Fu SS (2010). Racial/ethnic differences in menthol cigarette smoking, population quit ratios and utilization of evidence-based tobacco cessation treatments. Addiction, 105(si), 75–83. 10.1111/j.1360-0443.2010.03200.x [PubMed: 21059138]

StataCorp. (2015). Stata Statistical Software: Release 14. College Station, TX: StataCorp LP.

Trinidad DR, Pérez-Stable EJ, White MM, Emery SL, & Messer K (2011). A nationwide analysis of US Racial/ethnic disparities in smoking behaviors, smoking cessation, and cessation-related factors. Amedcan Journal of Public Health, 101(4), 699–706. 10.2105/AJPH.2010.191668

U.S. Department of Health and Human Services. (2020). Smoking Cessation A Report of the Surgeon General. Atlanta, GA.

Vinci C, Malkhasyan L, Simmons VN, & Correa-Fernandez V (2020). The relationship of mindfulness and mindfulness-related practices with alcohol use among Hispanics/Latinx. Psychiatry Research, 285, 112774 10.1016/j.psychres.2020.112774 [PubMed: 32035378]

Watkins KE, Paddock SM, Zhang L, & Wells KB (2006). Improving care for depression in patients with comorbid substance misuse. AJP, 163(1), 125–132. 10.1176/appi.ajp.163.1.125

Webb MS, Rodríguez-Esquivel D, & Baker EA (2010). Smoking cessation interventions among Hispanics in the United States: A systematic review and mini meta-analysis. Amedcan Journal of Health Promotion, 25(2), 109–118. 10.4278/ajhp.090123-LIT-25 [PubMed: 21039291]

Woolard R, Liu J, Parsa M, Merriman G, Tarwater P, Alba I, … Cherpitel CJ (2015). Smoking is associated with increased risk of binge drinking in a young adult Hispanic Population at the US-Mexico Border. Substance Abuse, 36(3), 318–324. 10.1080/08897077.2014.987945 [PubMed: 25492554]

Zvolensky MJ, Bakhshaie J, Shepherd JM, Garey L, Peraza N, Vi ana AG, … Brown RA (2019). Anxiety sensitivity and smoking outcome expectancies among Spanish-Speaking Latinx adult

smokers. Experimental and Clinical Psychopharmacology, 27(6), 569–577. 10.1037/pha0000270 [PubMed: 30896240]

Zvolensky MJ, Bakhshaie J, Shepherd JM, Peraza N, Garey L, Vi ana AG, … Brown RA (2019). Anxiety sensitivity and smoking among Spanish-speaking Latinx smokers. Addictive Behaviors, 90, 55–61. 10.1016/j.addbeh.2018.10.022 [PubMed: 30359848]

Zvolensky MJ, Shepherd JM, Bakhshaie J, Garey L, Vi ana AG, & Peraza N (2019). Emotion dysregulation and smoking outcome expectancies among Spanish-speaking Latinx adult cigarette smokers in the United States. Psychology of Addictive Behaviors, 33(6), 574–579. 10.1037/adb0000481 [PubMed: 31246070]

Zvolensky MJ, Shepherd JM, Bakhshaie J, Garey L, Vi ana AG, & Peraza N (2019). Emotion dysregulation and cigarette dependence, perceptions of quitting, and problems during quit attempts among Spanish-speaking Latinx adult smokers. Addictive Behaviors, 96, 127–132. 10.1016/j.addbeh.2019.05.002 [PubMed: 31077888]

Zvolensky MJ, Vujanovic AA, Miller MOB, Bernstein A, Yartz AR, Gregor KL, … Gibson LE (2007). Incremental validity of anxiety sensitivity in terms of motivation to quit, reasons for quitting, and barriers to quitting among community-recruited daily smokers. Nicotine & Tobacco Res., 9(9), 965–975. 10.1080/14622200701540812

Table 1

Means, standard deviations, and correlations of relevant study variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Medical Conditions	1.00																
2. Non-Alcohol Drug Use	0.14*	1.00															
3. Years Smoked	−0.06	−0.18***	1.00														
4. Past Quit Attempts	0.02	0.03	0.11*	1.00													
5. AUDIT-C	0.20***	0.24***	−0.04	0.14**	1.00												
6. SCQ-NC	0.12*	0.12*	0.15**	0.01	0 29***	1.00											
7. SCQ-PR	0.09	0.08	0.22***	−0.09	0.18***	0.64***	1.00										
8. SC-NR	0.13*	0.11*	0.18***	−0.01	0.29***	0.86***	0.79***	1.00									
9. SCQ-AW	0.09	0.08***	0.21***	−0.05	0.22***	0.83***	0.82***	0.89***	1.00								
10. I2R	0.09	0.05	−0.02	−0.04	−0.04	0.03	0.13*	0.07	0.14**	1.00							
11. Quit 30-day	0.13*	0.16**	−0.15**	0.15**	0.20***	0.01	−0.06	0.01	−0.03	0.20***	1.00						
12. Quit 6-month	0.16**	0.17**	−0.12	0.10	0.16**	0.09	0.13*	0.11*	0.09	0.37***	0.49***	1.00					
13. C2R	0.04	0.04	−0.08	−0.02	0.31***	0.08	0.21***	0.19***	0.15**	0.04	0.13*	0.11*	1.00				
14. QSE	−0.01	0.02	−0.12	−0.12*	0.12*	0.00	0.14**	0.07	0.06	0.05	0.05	0.08	0.59***	1.00			
15. Barriers to Cessation	0.29***	0.21***	0.09	0.10	0.30***	0.38***	0.29***	0.37***	0.36***	0.06	0.06	0.10	−0.05	−0.09	1.00		
16. Cigarette Dependence	0.32***	0.18***	0.12*	0.04	0.22***	0.42***	0.31***	0.39***	0.37***	−0.02	0.12*	0.08	0.03	−0.07	0.52***	1.00	
17. Quit Problems	0.32***	0.20***	−0.09	0.19***	0.28***	0.24***	0.08	0.19***	0.15**	0.02	0.18***	0.13*	−0.03	−0.07	0.47***	0.38***	1.00
Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
M	2.01	0.48	11.39	3.92	4.69	22.81	30.70	41.02	30.28	0.52	0.50	0.67	2.78	2.96	20.91	7.57	10.45
SD	2.55	0.50	9.71	5.26	3.19	8.58	10.09	13.25	9.81	0.50	0.50	0.47	1.20	1.16	14.11	3.52	5.97

Addict Behav. Author manuscript; available in PMC 2022 February 01.

Note. N = 359; M and SD are used to represent mean and standard deviation, respectively. AUDIT-C = Alcohol Use Disorder Identification Test – Consumption Subscale; SCQ-NC = Smoking Consequences Questionnaire-Negative Consequences; SCQ-PR = Smoking Consequences Questionnaire-Positive Reinforcement; SCQ-NR = Smoking Consequences Questionnaire-Negative Reinforcement; SCQ-AW = Smoking Consequences Questionnaire-Appetitive-Weight Control; I2R = Intention to Reduce Smoking; C2R = Confidence to Reduce Smoking; QSE = Quitting self-efficacy

* $p < .05$.

** $p < .01$.

*** $p < .001$

Table 2

Effects of alcohol consumption on smoking expectancies.

	Negative Consequences				Positive Reinforcement				Negative Reinforcement				Appetitive/Weight Control			
	b	**SE**	**P**	**sr2**	**b**	**SE**	**P**	**sr2**	**b**	**SE**	**P**	**sr^2**	**b**	**SE**	**P**	**sr^2**
Intercept	22.73	6.10	<0.001	–	35.71	5.90	<0.001	–	40.27	10.84	<0.001	–	29.09	9.39	0.002	–
Male	−0.34	6.11	0.955	0.000	−6.66	5.94	0.263	0.002	−0.41	10.86	0.970	0.000	0.19	9.41	0.984	0.000
Female	−0.79	6.12	0.897	0.000	−5.45	5.95	0.360	0.002	−0.32	10.87	0.977	0.000	0.74	9.43	0.937	0.000
Income	0.30	0.20	0.132	0.006	0.45	0.24	0.060	0.009	0.48	0.32	0.139	0.006	0.41	0.23	0.082	0.008
Education	0.08	0.45	0.865	0.000	0.24	0.52	0.640	0.001	0.39	0.69	0.574	0.001	−0.20	0.52	0.705	0.000
Years in the US	−0.10	0.46	0.822	0.000	−0.71	0.47	0.133	0.005	−1.09	0.64	0.090	0.007	−0.14	0.50	0.779	0.000
Medical Conditions	0.25	0.18	0.171	0.005	0.21	0.21	0.315	0.003	0.32	0.28	0.252	0.003	0.22	0.21	0.290	0.003
Non-Alcohol Drug Use	1.42	0.89	0.113	0.006	1.87	1.06	0.080	0.008	2.28	1.35	0.093	0.007	1.40	1.02	0.172	0.005
Years Smoked	0.16	0.04	<0.001	0.032	0.28	0.05	<0.001	0.066	0.31	0.06	<0.001	0.050	0.25	0.05	<0.001	0.059
Past Quit Attempts	−0.08	0.07	0.280	0.002	−0.30	0.09	0.001	0.022	−0.20	0.11	0.076	0.006	−0.20	0.13	0.121	0.010
AUDIT-C	**0.65**	**0.16**	**<0.001**	**0.046**	0.49	0.19	0.011	0.018	**1.06**	**0.25**	<0.001	**0.050**	**0.59**	**0.19**	**0.002**	**0.029**
Adjusted alpha			0.0050								0.0045				0.0063	

Note. N = 359; Data were analyzed using linear regressions; Income, education, number of years in the U.S., number of medical conditions, number of years a smoker, number of past quit attempts, and alcohol consumption were mean centered prior to analysis; Gender and non-alcohol drug use were left uncentered; AUDIT-C = Alcohol Use Disorder Identification Test – Consumption subscale; b = unstandardized regression coefficient; SE = robust standard error; sr^2 represents the semi-partial correlation squared; Adjusted alpha = alpha value computed using the Holm-Bonferroni Method (Holm, 1979); **bold text** indicates that AUDIT-C was significantly associated with the outcome at the adjusted alpha level.

Table 3

Effects of alcohol consumption on barriers to smoking cessation.

	Global Barriers Scale				Cigarette Dependence				Past Quit Problems			
	b	**SE**	**P**	**sr^2**	**b**	**SE**	**P**	**sr^2**	**b**	**SE**	**P**	**sr^2**
Intercept	27.67	12.71	0.030	–	3.97	0.79	<0.001	–	10.86	1.58	<0.000	–
Male	−9.32	12.74	0.465	0.002	3.19	0.82	<0.001	0.004	−0.84	1.64	0.608	0.000
Female	−8.64	12.75	0.498	0.002	3.08	0.82	<0.001	0.004	−1.18	1.60	0.462	0.000
Income	0.31	0.33	0.347	0.002	0.08	0.08	0.303	0.002	−0.01	0.14	0.965	0.000
Education	0.80	0.73	0.274	0.003	−0.06	0.17	0.734	0.000	0.07	0.30	0.822	0.000
Years in the US	−1.81	0.72	0.012	0.016	−0.32	0.16	0.048	0.008	−0.43	0.29	0.139	0.005
Medical Conditions	1.17	0.26	<0.001	0.039	0.36	0.08	<0.001	0.061	0.56	0.10	<0.000	0.051
Non-Alcohol Drug Use	4.37	1.39	0.002	0.021	1.00	0.36	0.005	0.018	1.29	0.61	0.034	0.011
Years Smoked	0.22	0.08	0.008	0.021	0.07	0.02	0.003	0.031	−0.03	0.03	0.283	0.003
Past Quit Attempts	0.10	0.11	0.391	0.001	0.00	0.03	0.856	0.000	0.18	0.08	0.018	0.024
AUDIT-C	**0.91**	**0.28**	**0.001**	**0.033**	0.13	0.07	0.076	0.010	**0.31**	**0.11**	**0.004**	**0.022**
Adjusted Alpha			0.0056								0.0071	

Note. N = 359; Data were analyzed using linear regressions. Income, education, number of years in the U.S., number of medical conditions, number of years a smoker, number of past quit attempts, and alcohol consumption were mean centered prior to analysis; Gender and non-alcohol drug use were left uncentered; AUDIT-C = Alcohol Use Disorder Identification Test – Consumption subscale; b = unstandardized regression coefficient; SE = robust standard error; sr^2 represents the semi-partial correlation squared; Adjusted alpha = alpha value computed using the Holm-Bonferroni Method (Holm, 1979); **bold text** indicates that AUDIT-C was significantly associated with the outcome at the adjusted alpha level.

[a]We modeled past quit problems using normal, negative binomial, and zero-inflated negative binomial distributions. Model fit indices indicated that a normal distribution provided the best fit (greater than10 BIC reduction; Raftery, 1995).

Table 4

Effects of alcohol consumption on smoking intentions and confidence.

	Intentions to Reduce Smoking				Quit 30-day				Quit 6-month[a]				Confidence to Reduce Smoking				Quitting Self-Efficacy			
	OR	**SE**	**P**	**sr²**	**OR**	**SE**	**P**	**sr²**	**OR**	**SE**	**P**	**sr²**	**b**	**SE**	**P**	**sr²**	**b**	**SE**	**P**	**sr²**
Intercept	1.24	2.59	0.918	–	0.25	0.32	0.274	–	1.20	0.61	0.717	–	3.09	1.02	0.003	–	4.21	0.95	<0.001	–
Male	0.84	1.76	0.934	0.000	3.46	4.40	0.328	0.001	1.76	0.88	0.257	0.020	−0.22	1.02	0.832	0.000	−1.18	0.95	0.217	0.006
Female	0.72	1.51	0.876	0.000	3.13	3.98	0.370	0.001	1.24	0.61	0.671	0.017	−0.32	1.02	0.752	0.000	−1.27	0.95	0.181	0.006
Income	1.09	0.05	0.069	0.009	1.21	0.06	<0.000	0.031	1.20	0.07	0.001	0.026	0.04	0.03	0.126	0.006	0.05	0.03	0.085	0.009
Education	1.05	0.12	0.685	0.001	0.80	0.10	0.065	0.009	0.97	0.12	0.797	0.000	0.06	0.06	0.375	0.002	0.01	0.06	0.849	0.000
Years in the US	0.96	0.10	0.690	0.000	0.80	0.09	0.047	0.010	0.88	0.10	0.259	0.004	−0.02	0.06	0.712	0.000	−0.03	0.06	0.671	0.001
Medical Conditions	1.08	0.05	0.090	0.009	1.05	0.05	0.323	0.002	1.14	0.07	0.024	0.010	−0.01	0.02	0.672	0.000	−0.02	0.02	0.468	0.001
Non-Alcohol Drug Use	1.32	0.31	0.226	0.004	1.55	0.37	0.070	0.008	1.80	0.46	0.020	0.012	−0.08	0.13	0.532	0.001	−0.05	0.12	0.677	0.000
Years Smoked	1.00	0.01	0.916	0.000	0.97	0.01	0.023	0.013	0.98	0.01	0.066	0.008	−0.01	0.01	0.165	0.005	−0.01	0.01	0.045	0.011
Past Quit Attempts	0.99	0.02	0.591	0.001	1.07	0.04	0.043	0.024	1.05	0.03	0.065	0.014	−0.01	0.01	0.194	0.003	−0.03	0.01	0.005	0.016
AUDIT-C	0.94	0.04	0.081	0.008	1.04	0.04	0.317	0.002	1.03	0.04	0.552	0.002	**0.12**	**0.02**	**<0.001**	**0.073**	0.04	0.02	0.109	0.009
Adjusted alpha															0.0042					

Note. N = 359; Data were modeled using linear (confidence to reduce smoking and quitting self-efficacy) and logistic (intentions to reduce smoking, quit 30-day, and quit 6-month) regressions. Income, education, number of years in the U.S., number of medical conditions, number of years a smoker, number of past quit attempts, and alcohol consumption were mean centered prior to analysis; Gender and non-alcohol drug use were left uncentered; AUDIT-C = Alcohol Use Disorder Identification Test – Consumption subscale; OR = odds ratio; b = unstandardized regression coefficient; SE = robust standard error; sr^2 represents the semi-partial correlation squared; Adjusted alpha = alpha value computed using the Holm-Bonferroni Method (Holm, 1979); **bold text** indicates that AUDIT-C was significantly associated with the outcome at the adjusted alpha level.

[a]Given issues with sparse data bias, the analyses for Quit 6 Month were conducted using penalized estimation without robust standard errors (Greenland, Mansoumia, & Altman, 2016). We used conservative 95% prior limits on the odds ratio scale of [0.25, 4.00]. The penalized variables were Male and Female.