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Prohibition of e-cigarettes in the US: Are prohibitions where alcohol is consumed related to lower alcohol consumption?

Alexandra R. Hershberger[*], **Kenny A. Karyadi**, and **Melissa A. Cyders**

Department of Psychology, Indiana University-Purdue University in Indianapolis, 402 North Blackford Street, LD 124, Indianapolis, IN 46202, USA

Abstract

Recently, research has suggested negative consequences related to electronic cigarette (e-cig) use, including the increased risk for alcohol use and abuse. Previous work found that cigarette smoking ban legislation lowered overall smoking and alcohol use rates; however, researchers have not yet examined the potential effects of prohibiting e-cig use. The present study surveyed 617 individuals from a community-based online sample in the US (mean age = 33.33, SD = 10.50, 54.7 per cent female) who reported their smoking/e-cig use status, alcohol consumption, and the presence of e-cig prohibitions where they consume alcohol. E-cig prohibition was associated with a lower likelihood of being an e-cig user (OR = 0.12, $p < 0.001$) or dual user (use both cigarettes and e-cigs) (OR = 0.07, $p < 0.001$). Alcohol Use Disorder Identification Test scores ($b = -1.92$, $p < 0.001$), total drinks consumed over 14 days ($b = -4.58$, $p = 0.002$), and average drinks per drinking day ($b = -0.71$, $p < 0.001$) were all lower when e-cigs were prohibited. Findings are an initial step in this line of research and suggest important future work examining implications of e-cig prohibition recommendations and policy.

Keywords

e-cigarettes; alcohol consumption; tobacco; prohibitions

Introduction

Electronic cigarettes (e-cigs) approximate cigarettes in experience,[1] blood nicotine levels,[2] nicotine absorption,[3] and serum cotinine levels.[4] Individuals with substance use disorders (SUD) are at disproportionate risk for nicotine use[5] and have e-cig use rates of 17 per cent,[6] almost three times the prevalence rate in the US general population.[7] This is particularly troubling, given the emerging literature pointing to the potential negative health effects of e-cigs on respiratory and cardiovascular function in both humans and animals,[8–11] and to potentially harmful substances in both e-cig liquid and vapor.[8] As a result of such research, as of 5 May 2016, the Food and Drug Administration in the United States extended its rules to include e-cigs, requiring that manufacturers provide rigorous documentation and place labels on their products stating “WARNING: This product contains nicotine. Nicotine is an addictive chemical.”[12] Collectively, the potential harm from direct and second-hand

[*]Corresponding author. alermart@iupui.edu.

exposure to e-cig vapor is of great concern when considering policy and legislation related to e-cig use in public. Also worrisome is that higher problematic alcohol consumption[13] has been found in e-cig users. Those with alcohol use disorders may be at risk for increased or perpetuated alcohol use if using e-cigs concurrently.

One way of limiting the concurrent use of e-cigs and alcohol would be to prohibit e-cig use where alcohol is consumed, such as in public places, private buildings (e.g., dorm rooms), or in bars or restaurants. For the present study, we defined e-cig and cigarette *prohibitions* as forbidding e-cig or cigarette for any reason (e.g., written rules, legislation, and personal preference), whereas we defined e-cig and cigarette bans as forbidding use as a direct result of legislation. As of July 1, 2012, there were only 12 US states with e-cig ban legislation in smoke-free venues, while 30 US states have state-wide smoking ban legislation.[14] E-cig bans could potentially reduce alcohol consumption by decreasing the pairing of e-cig use and alcohol in time and place — one way that behaviors come to be associated. The consequences of smoking bans help illustrate this point. Comprehensive cigarette ban legislation resulted in a decline in cigarette use and related disease[15–17] and in alcohol consumption.[18–20] The decrease in alcohol consumption since the enactment of smoking ban legislation is likely due to the strong relationship between smoking and alcohol consumption[5] and reduced pairing of the substances following the bans.

Perhaps prohibiting the combined use of e-cigs and alcohol might decrease e-cig use and alcohol consumption. We examined individuals' smoking status (cigarette user, dual user of e-cigs and cigarettes, e-cig user, nonuser), alcohol consumption, and the presence of an e-cig prohibition where individuals drink most frequently. Because e-cig prohibitions may be more common where a cigarette prohibition exists,[14] we controlled for cigarette prohibitions. Because our definition of *prohibition* includes both public and private venues, we examined variability in smoking and alcohol use by public and private drinking venues before combining venues. We hypothesized that those reporting that e-cig use is prohibited where they consume alcohol would have lower rates of e-cig and dual use and lower alcohol consumption rates.

Methods

Participants

We recruited 743 participants using Amazon s Mechanical Turk (MTurk), an online web service that connects researchers to individuals willing to complete tasks for compensation. It should be noted that the present sample was also used in the development of the Nicotine and Other Substance Interaction Expectancy Questionnaire.[13] We paid participants $0.75 US. The MTurk subject pool has recently been used successfully to study psychological constructs.[13,21]

Inclusion and exclusion criteria—Participants must have reported being (1) 21 years of age or older, (2) current alcohol drinkers, (3) United States residents, and (4) able to read and answer a questionnaire in English.

Procedure

We posted the present study on MTurk, entitled “E-cigs, cigarettes and alcohol survey (Must consume alcohol to participate). For the present study, participants entered Survey Monkey (online cloud-based survey development software). After reading the study information, participants selected “yes” or “no” to participate in the study. Participants reported if they drink alcohol and are above the age of 21. Answering “no” to either question disqualified the participant and the survey window automatically closed. Answering “yes” allowed them to start the study. Participants responded to the questions and upon completion we awarded participants $0.75 US.

Materials

Demographics—Participants provided their age, gender, and ethnicity (Caucasian/White, Hispanic/Latino, Asian/Pacific Islander, Black/African American, Native American/Alaskan Native, and Other).

Cigarette smoking and e-cig use—We assessed cigarette and e-cig use using two-face valid measures created for the current study (“Do you currently smoke cigarettes?”; “Do you currently use an electronic cigarette?”) to determine the smoking status of each participant. Smoking status refers to four categories, with all categories being independent from one another: cigarette users, e-cig users, both e-cig and cigarette users (dual users), and nonusers. We assessed the frequency of e-cig use with a single item (“How often do you use an electronic cigarette?” with four response options: “A few times a month,” “A few times a week,” “A few times a day”, and “At least ten times per day”). This item has previously been shown to correspond with ‘social’ versus regular use, with social users reporting less frequent e-cig use than regular users.[13]

Alcohol use—We computed three variables to characterize alcohol use. First, the Alcohol Use Disorder Identification Test (AUDIT)[22] measured problematic alcohol consumption; the AUDIT is a well-validated 10-item scale that assesses hazardous alcohol consumption.[23] We calculated total AUDIT score by summing scores on the items. Scores range from 0 to 40, with a score of 8 indicating probable hazardous alcohol consumption. Second, the Timeline Followback calendar (TLFB)[24] assessed alcohol consumption over the previous 2 weeks. The TLFB aids participants recall daily alcohol consumption. Responses on the TLFB have adequate test-retest reliability[25] and high convergent validity.[26] We calculated two variables from the TLFB:

- *total drinks* by summing the number of drinks reported across the 2-week TLFB for each participant and
- *average drinks* by taking total drinks and dividing it by the total number of days participants reported consuming alcohol across the 2-week TLFB.[27,28]

Public versus private drinking—Participants self-reported where they consumed alcohol most frequently in the past 2 weeks using the following response options, categorized as public or private venues: (1) Private: at home (including around their home, such as the porch, patio, or sidewalk), at someone else’s home (including around their home,

such as the porch, patio, or sidewalk) or (2) Public: outside (in a public place, such as a park, tailgating area, shopping center, or shopping area), at a bar or restaurant, at a sporting event, at work, at school, in a car, at a religious service or activity, or other. We coded responses for each participant as either drinking in public or private.

E-cig use and cigarette use prohibition—Participants self-reported in two separate questions if e-cig and cigarette use were prohibited where they consume alcohol most frequently ("Are people able to use e-cigs/cigarettes where you drink most frequently without having to move to a separate area, such as outside?") with three response options ("Yes, people are able to use e-cigs/cigarettes where I drink most frequently," "No, people are not able to use e-cigs/cigarettes where I drink most frequently," and "Don't Know").

Careless responding—Due to the online data collection methodology, we assessed careless responding by the use of four "bogus items" placed randomly throughout the test ("I have never brushed my teeth," "I do not understand a word of English," I sleep less than one hour per night," and "I have been to every country in the world"). Participants responded to items on a 1 (agree strongly) to 7 (disagree strongly) scale. We considered an answer of 1 or 2 on any item indicative of careless responding and excluded data from participants who indicated such responses.[13]

Results

Preliminary and descriptive analyses

An initial sample of 723 participants completed the study. We excluded 51 participants from data analysis for failing 2 or more random responding items. Next, we removed 13 outlier participants scoring greater than 4 SD above the mean on total AUDIT, total drinks, or average drinks, as determined a priori, and we excluded individuals who reported "I Don't Know" if e-cig or cigarette use is prohibited where they consume alcohol (final sample, N = 617, mean age = 33.33, SD = 10.50, 54.7 per cent female, 77.6 per cent Caucasian; see Table 1). Those excluded did not differ from the remaining sample in age, gender, or ethnicity.

Drinking in public versus private

From the sample, 75.1 per cent reported drinking in private most frequently, 24.1 per cent reported drinking in public most frequently, and 0.7 per cent did not provide a response. Public and private drinkers did not vary significantly by gender, $\chi^2 = 1.73$, $p = 0.42$, or age, $t(683) = 0.58$, $p = 0.56$. We conducted t-tests on three independent samples to examine if alcohol consumption varied by reporting public versus private drinking. Our results indicated that public and private drinkers did not differ significantly on the AUDIT, $t(685) = -1.48$, $p = 0.14$; total drinks, $t(685) = -1.43$, $p = 0.15$; or average drinks, $t(683) = 1.24$, $p = 0.22$. Next, we conducted three Chi-square tests of independence to examine if public and private drinkers varied in e-cig use versus no use, cigarette use versus no use, and dual use versus no use. Results indicate that public and private drinkers did not vary by e-cig use versus no use, $\chi^2 = 0.45$, $p = 0.80$; cigarette use versus no use, $\chi^2 = 0.30$, $p = 0.86$; or dual use versus no use, $\chi^2 = 0.25$, $p = 0.88$.

Smoking status and e-cig prohibition

We conducted a series of five hierarchical logistic regressions to examine the association between e-cig prohibition (dummy coded, 0-e-cigs allowed, 1-e-cigs prohibited) and smoking status in the following steps: (1) age, gender (dummy coded 0-male, 1-female), ethnicity (dummy coded with "Caucasian" as the reference group), cigarette smoking prohibition (0-cigarettes allowed, 1-cigarettes prohibited) and (2) smoking status (see Table 2).

Model 1 compared the likelihood of being an e-cig user to the likelihood of being a nonuser (reference group): There was a significantly lower likelihood of being an e-cig user than a nonuser when e-cigs are prohibited (OR = 0.12, $p < 0.001$). Model 2 compared the likelihood of being an e-cig user to the likelihood of being a dual user (reference group): There was no significant difference in the likelihood of being an e-cig user or dual user (OR = 0.96, $p = 0.52$) across e-cig prohibition status. Model 3 compared the likelihood of being an e-cig user to the likelihood of being a cigarette user (reference group): There was no significant difference in the likelihood of being an e-cig user or a cigarette user (OR = 0.51, $p = 0.12$) across e-cig prohibition status. Model 4 compared the likelihood of being a dual user to the likelihood of being a cigarette user (reference group): There was a significantly lower likelihood of being a dual user than a cigarette user when e-cigs are prohibited (OR = 0.29, $p = 0.003$).Model 5 compared the likelihood of being a dual user to the likelihood of being a nonuser (reference group): There was a significantly lower likelihood of being dual user than a nonuser user when e-cigs are prohibited (OR = 0.07, $p < 0.001$).

E-cig prohibition and E-cig use frequency

We conducted two hierarchical linear regressions to examine the relationship between e-cig prohibition and e-cig use frequency (see Figure 1) in dual and e-cig users (run in separate models) in the following steps: (1) age, gender, ethnicity, cigarette smoking prohibition and (2) e-cig prohibition (see Table 3). Results indicate that e-cig users use e-cigs less frequently when e-cigs are prohibited than when they are allowed ($B = -1.26$, $p = 0.01$). Dual users frequency of e-cig use did not significantly vary by e-cig prohibition ($B = -0.01$, $p = 0.29$).

E-cig prohibition and alcohol consumption

We conducted hierarchical linear regression analyses (Table 4; Figure 2) to examine the relationship between e-cig prohibition and each alcohol consumption measure (AUDIT, total drinks, average drinks) in the following steps: (1) age, gender, ethnicity, cigarette smoking prohibition and (2) e-cig prohibition. Above and beyond the effects of age, gender, ethnicity, and cigarette prohibition, e-cig prohibition was significantly associated with lower AUDIT scores, $b = -1.92$, $p < 0.001$. Above and beyond the effects of age, gender, ethnicity, and cigarette prohibition, e-cig prohibition was significantly associated with lower total drinks, $b = -4.58$, $p = 0.002$. Above and beyond the effects of age, gender, ethnicity, and cigarette prohibition, e-cig prohibition was significantly associated with lower average drinks, $b = -0.71$, $p < 0.001$. Cigarette prohibition was not significantly related to AUDIT, $b = -0.76$, $p = 0.08$, total drinks, $b = -1.77$, $p = 0.20$, or average drinks, $b = -0.03$, $p = 0.88$, after controlling for demographics and e-cig prohibition.

Discussion

Our findings suggest that the prohibition of e-cigs where one consumes alcohol is associated with a significantly lower likelihood that one uses e-cigs or dually uses e-cigs and cigarettes. E-cig prohibitions are related to less frequent e-cig use in e-cig users, although not in dual users. And, e-cig prohibition is associated with less alcohol consumption. The gathering of these initial data is the first step in a program of research. They suggest viability of the hypothesis that implementing e-cig bans in bars and restaurants, as well as recommending restrictions in private places, such as apartment complexes and dorm rooms, could potentially reduce both e-cig use and alcohol use.

Although we expected that dual users would use e-cigs less frequently when e-cigs were prohibited, this finding was not supported. It may be that the present study was underpowered to detect such effects. It may also be that, as a result of using cigarettes concurrently, cigarettes serve as a cue to use e-cigs in dual users, resulting in overall higher e-cig use frequency for dual users, although determining this is beyond the present study. That the number of dual users and cigarette users did not vary by e-cig prohibition interested us. Again, this could be the result of being underpowered to detect significant effects, or potentially reflect the true state of nature.

Limitations and recommendations for future research

The present findings call attention to a novel and important area within e-cig policy research; however, there are some limitations to discuss. First, e-cig prohibition was defined to include any place where one consumes alcohol, whereas previous studies on smoking bans have focused on legislation. Why did we deem it important to include any prohibition, not just ones associated with direct legislation? E-cig bans and the larger scope of prohibitions (less formal rules than legislation) might affect the pairing of e-cigs and alcohol. Second, e-cig users are often former smokers, and smokers have higher prevalence of alcohol use disorders. Future research should elucidate the effects of being a former smoker on e-cig and alcohol use. Third, as the present sample was predominately White and well-educated, the findings may not generalize to more diverse samples. Additionally, it is possible we were underpowered due to the limited number of e-cig and dual users to detect some effects. Fourth, due to the cross-sectional nature of this study, we cannot establish directions of these effects; to avoid self-report biases, further research is needed to examine whether e-cig prohibition affects alcohol consumption in laboratory and naturalistic settings. Applying previously identified mechanisms connecting the cigarette and alcohol relationship to research with e-cigs, such as alcohol priming on e-cig users,[29] is warranted.

Finally, although the present study investigated general e-cig prohibitions, the growing popularity of e-cig ban legislation would be a prime avenue for investigating the e-cig and alcohol relationship. Studies that compare e-cig use and alcohol consumption in counties with and without e-cig ban legislation and studies that longitudinally examine changes in e-cig use and alcohol consumption as related to the enactment of e-cig ban legislation would greatly aid in elucidating these relationships. We found no differences in alcohol consumption and smoking status by public or private alcohol consumption in the present sample. This is an important variable to address in future research, as the policy implications

for public and private drinking are somewhat distinct. Addressing e-cig use in public would likely be through legislative action, while addressing e-cig use in private would likely be through encouraging private rules and policies plus community outreach to educate private owners.

Conclusion

Overall, this work supports future studies to elucidate the causal direction and mechanisms linking e-cig prohibition to smoking status and alcohol use. Prohibiting e-cigs where alcohol is consumed may benefit individuals who have or are at risk for alcohol use disorders by potentially decreasing frequency of use and total consumption. Further, as e-cigs are often used for smoking cessation, it may be ill-advised for individuals at risk for problematic alcohol consumption to use e-cigs for smoking cessation.[30] Additionally, policy makers may wish to examine potential positive benefits that e-cig prohibitions could have for alcohol and e-cig use.

Biographies

Alexandra Hershberger, M.S. is a Clinical Psychology Graduate student at IUPUI. Her research is funded by the National Institute on Alcohol Abuse and Alcoholism Predoctoral Research Fellowship (F31-AA024682-01A1).

Kenny A. Karyadi, PhD is a Predoctoral fellow with research supported by the National Institute on Alcohol Abuse and Alcoholism Predoctoral Fellowship (AA07462). His research has examined the mechanisms underlying problematic substance use behaviors and neuropsychological test performance.

Melissa A. Cyders, PhD, HSPP is Associate Professor of Psychology, in the Clinical psychology faculty at IUPUI with research funded by the National Institute on Alcohol Abuse and Alcoholism under (1) Mentored Career Development Award (K01AA020102) and (2) the Indiana Alcohol Research Center Grant Renewal.

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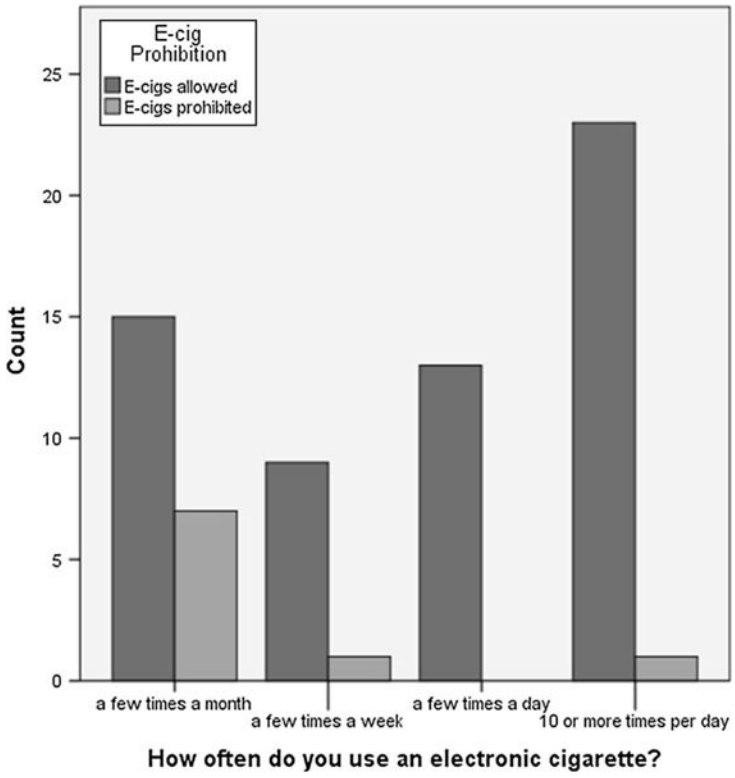

Figure 1.

The relationship between e-cig use frequency and e-cig prohibition for e-cig and dual users. $\chi^2 = 11.28$, $p = 0.02$.

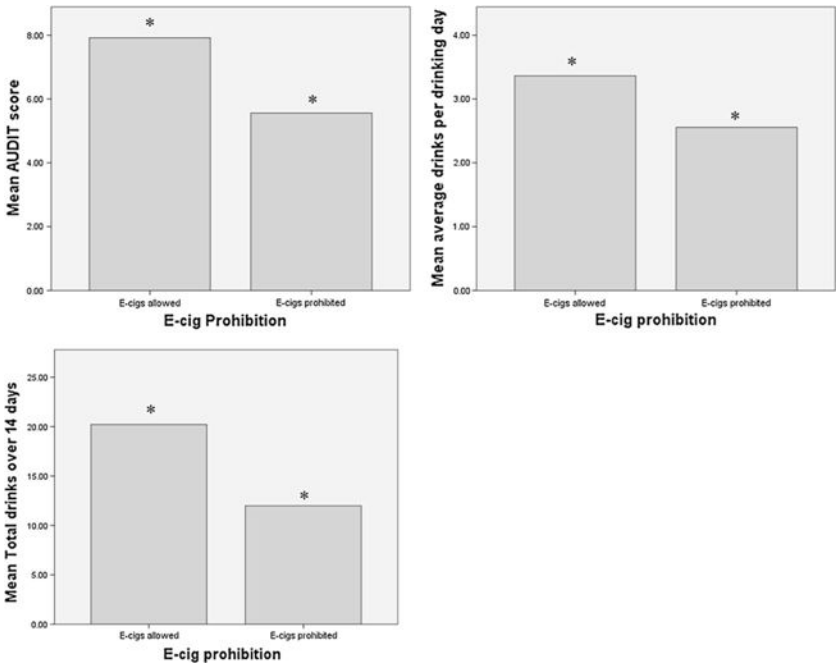

Figure 2.

Mean AUDIT (top left), average drinks (*top right)*, and total drinks *(bottom left)* by e-cig prohibition. AUDIT: $t(615) = 5.41$, $p < 0.001$, $d = 0.50$; average drinks: $t(615) = 5.03$, $p < 0.001$, $d = 0.46$; total drinks: $t(615) = 4.86$, $p < 0.001$, $d = 0.16$. AUDIT-Alcohol Use Disorder Identification Test. *$p < 0.001$.

Table 1

Sample characteristics

Variables	*Percentage (%)*	*N*	*E-cigs prohibited*	*E-cigs allowed*
Male	45.30	279	74	205
Female	54.70	337	107	230
Caucasian	77.60	479	137	342
African American	7.10	44	9	35
Hispanic	9.20	57	20	37
Asian	3.70	23	11	12
Other	0.20	1	2	5
Cigarette prohibition	40.80	365	179	186
Cigarettes allowed	51.20	251	249	3
E-cig prohibition	29.50	182	–	–
Nonuser	39.20	242	133	109
E-cig user	12.80	79	11	68
Dual user	28.40	175	12	163
Cigarette user	19.60	121	26	95

Note: Chi-square tests of independence were conducted. The following relationships were significant: Smoking Stating 9 E-cig Prohibition $\chi^2 = 131.52$, $p < 0.001$.

Table 2

Relationship between e-cig prohibition and smoking status

	B	*Wald*	*Sig.*	*Exp(B)*	*95 per cent CI for Exp(B)*	
					Lower	*Upper*
E-cig versus no use						
Age	−0.02	1.91	0.17	0.98	0.95	1.01
Gender	0.20	0.45	0.50	1.23	0.68	2.23
Hispanic	0.43	0.79	0.37	1.54	0.59	4.02
Asian	−1.26	1.34	0.25	0.28	0.03	2.40
African American	0.27	0.23	0.63	1.31	0.44	3.92
Other	0.29	0.05	0.83	1.34	0.09	19.07
E-cig prohibition	−2.10	29.76	<0.001	0.12	0.06	0.26
E-cig versus dual						
Age	−0.04	5.17	0.02	0.96	0.93	1.00
Gender	0.55	3.50	0.06	1.74	0.97	3.11
Hispanic	0.30	0.41	0.52	1.35	0.54	3.41
Asian	−0.94	0.75	0.39	0.39	0.05	3.29
African American	−0.40	0.63	0.43	0.67	0.25	1.81
Other	0.88	0.37	0.54	2.41	0.14	41.50
E-cig prohibition	−0.04	0.41	0.52	0.96	0.86	1.08
E-cig versus cigarette						
Age	−0.03	3.40	0.07	0.97	0.94	1.00
Gender	0.20	0.41	0.52	1.22	0.66	2.26
Hispanic	0.19	0.14	0.71	1.21	0.44	3.35
Asian	−0.53	0.20	0.65	0.59	0.06	5.97
African American	0.18	0.10	0.76	1.19	0.39	3.66
Other	−0.15	0.02	0.90	0.86	0.07	9.99
E-cig prohibition	−0.67	2.39	0.12	0.51	0.22	1.20
Dual versus cigarette						
Age	0.01	0.03	0.87	1.00	0.98	1.02
Gender	−0.22	0.89	0.35	0.80	0.51	1.27

J Public Health Policy. Author manuscript; available in PMC 2017 July 01.

	B	*Wald*	*Sig.*	*Exp(B)*	*95 per cent CI for Exp(B)*	
					Lower	*Upper*
Hispanic	0.04	0.01	0.93	1.04	0.46	2.36
Asian	0.68	1.01	0.32	1.97	0.52	7.43
African American	0.44	1.06	0.30	1.55	0.67	3.56
Other	−0.91	0.54	0.46	0.40	0.04	4.55
E-cig prohibition	−1.23	8.90	0.003	0.29	0.13	0.66
Dual versus no use						
Age	0.01	0.34	0.56	1.01	0.99	1.02
Gender	−0.38	3.67	0.06	0.69	0.47	1.01
Hispanic	−0.24	0.49	0.48	0.78	0.40	1.55
Asian	−0.07	0.02	0.88	0.93	0.37	2.36
African American	0.63	2.93	0.09	1.87	0.91	3.82
Other	−0.36	0.09	0.77	0.70	0.06	7.83
E-cig prohibition	−0.29	54.70	<0.001	0.07	0.04	0.14

Note: Five independent hierarchical logistic regressions examining the relationship between e-cig prohibitions and smoking status. For each model, the first stated smoking status was dummy coded as 1, and the second stated smoking status coded as 0. Significance was determined on the $p < 0.01$ level and significant values are bolded.

J Public Health Policy. Author manuscript; available in PMC 2017 July 01.

Table 3

Relationship between e-cig use frequency and e-cig prohibition for e-cig and dual users

	B	*β*	*t*	*Sig.*	*95.0 per cent CI for B*	
					Lower bound	*Upper bound*
E-cig users						
Age	0.01	0.07	0.60	0.55	−0.03	0.05
Gender	−0.45	−0.18	−1.40	0.17	−1.09	0.19
Hispanic	−0.16	−0.04	−0.33	0.74	−1.11	0.80
Asian	0.65	0.06	0.52	0.60	−1.86	3.16
African American	−0.19	−0.04	−0.31	0.76	−1.38	1.01
Other	0.25	0.02	0.20	0.84	−2.23	2.73
Smoking prohibition	0.54	0.21	1.72	0.09	−0.09	1.18
E-cig prohibition	−1.26	−0.34	−2.62	0.01	−2.21	−0.30
Dual users						
Age	−0.01	−0.11	−1.47	0.14	−0.02	0.00
Gender	−0.45	−0.22	−3.08	0.00	−0.74	−0.16
Hispanic	−0.26	−0.07	−0.97	0.33	−0.79	0.27
Asian	−0.62	−0.12	−1.71	0.09	−1.35	0.10
African American	−0.40	−0.12	−1.66	0.10	−0.88	0.08
Other	0.18	0.01	0.18	0.86	−1.78	2.14
Smoking prohibition	−0.03	−0.18	−2.48	0.01	−0.05	−0.01
E-cig prohibition	−0.01	−0.08	−1.06	0.29	−0.02	0.01

Note: Hierarchical linear regression examining the relationship between e-cig use frequency and e-cig prohibition. E-cig prohibition dummy coded (0-e-cigs allowed, 1-e-cigs prohibited). Significance was determined on the $p < 0.01$ level and significant values are bolded.

Table 4

Relationship between e-cig prohibition and alcohol consumption measures

	b	95 *per cent CI b Lower*	95 *per cent CI b Upper*	*B*	*t*	*p*	ΔR^2	*p*
Outcome: AUDIT								
Step 1								
African American	0.75	−0.59	2.09	0.04	1.10	0.27	0.13	<0.001
Hispanic	−0.01	−1.23	1.22	0.01	−0.01	0.99		
Asian	−1.61	−3.50	0.28	−0.06	−1.67	0.10		
Other	0.22	−3.39	3.83	0.004	0.12	0.91		
Age	−0.09	−1.13	*−0.06*	−0.20	−5.29	<0.001		
Gender	−2.31	−3.02	−1.59	−0.24	−6.32	<0.001		
Cigarette prohibition	−0.76	−1.60	0.08	−0.08	−1.76	0.08		
Step 2								
E-cig prohibition	−1.52	−2.43	−0.6l	−0.14	−3.27	0.001	0.02	<0.001
Outcome: total drinks								
Step 1								
African American	2.05	−2.29	6.34	0.04	0.93	0.35	0.10	<0.001
Hispanic	−1.41	−5.37	2.55	−0.03	−0.70	0.49		
Asian	−5.38	−11.48	0.72	−0.07	−1.73	0.08		
Other	9.64	−2.00	21.29	0.06	1.63	0.10		
Age	−0.04	−0.15	0.07	−0.03	−0.78	0.44		
Gender	−7.69	−10.00	−5.38	0.25	−6.54	<0.001		
Cigarette prohibition	−1.77	−4.50	0.96	−0.06	−1.28	0.20		
Step 2								
E-cig prohibition	−4.58	−7.53	−1.64	−0.14	−3.05	0.002	0.014	0.002
Outcome: average drinks								
Step 1								
African American	−0.31	−0.83	0.21	−0.04	−1.15	0.25	0.10	<0.001
Hispanic	0.24	−0.24	0.71	0.04	0.97	0.33		
Asian	−0.36	−1.10	0.37	−0.04	−0.97	0.33		
Other	0.99	−0.42	2.39	0.05	1.38	0.17		

J Public Health Policy. Author manuscript; available in PMC 2017 July 01.

	b	95 *per cent CI b Lower*	95 *per cent CI b Upper*	*B*	*t*	*p*	ΔR^2	*p*
Age	−0.03	−0.04	−0.02	−0.17	−4.35	<0.001		
Gender	−0.82	−1.09	−0.54	−0.22	−5.75	<0.001		
Cigarette prohibition	−0.03	−0.35	0.30	−0.01	−0.15	0.88		
Step 2								
E-cig prohibition	−0.71	−1.06	−0.35	−0.18	−3.91	<0.001	0.02	<0.001

Note: Hierarchical linear regression. E-cig prohibition dummy coded with e-cigs allowed as the reference group. Estimates presented are for the final model. Significance was determined on the $p < 0.01$ level and significant values are bolded. AUDIT scores (mean = 6.62, SD = 4.59), total drinks (mean = 14.83, SD = 13.13), and average drinks (mean = 2.84, SD = 1.72) were approximately normally distributed. AUDIT-Alcohol Use Disorder Identification Test.