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Marijuana, Alcohol Use and Attempted Smoking Cessation in Adolescent Boys and Girls

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Abstract

Background—To determine the relationship between the frequency of current marijuana and alcohol use and cigarette-quit attempts in male and female adolescent smokers.

Methods—Data from a cross-sectional survey of health behaviors in high-school-age adolescents were analyzed. Current cigarette smokers (n=804) who reported use of at least 1 cigarette in the past month were divided into those with and without a history of at least 1 quit attempt (a self-reported episode of trying to “stop smoking”). Logistic regression models were fit to describe the association between the frequency of marijuana/alcohol use and a history of cigarette-quit attempts.

Results—Among the total sample, higher frequency marijuana use (more than six times in the past 30 days) and frequent binge drinking (more than 5 days of binge drinking in the past 30 days) decreased the odds of having a past cigarette-quit attempt (higher frequency marijuana adjusted odds ratio (AOR) = 0.56; 95% confidence interval (CI) =0.36–0.86) (frequent binge drinking AOR=0.49; 95%CI=0.29–0.83). A significant gender interaction was observed for the relationship between higher frequency marijuana use and a history of cigarette-quit attempts (p=0.03), with decreased odds in boys (AOR=0.41; 95% CI=0.22–0.77) but not in girls (AOR=0.71; 95% CI=0.37–1.33).

Conclusions—Adolescent smokers who report higher frequency marijuana use or frequent binge drinking have a decreased likelihood of a history of a cigarette-quit attempt. The gender-related association between higher frequency marijuana use and a history of quit attempts suggests

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The authors report no conflicts of interest.

AUTHOR CONTRIBUTIONS

Authors SKS, RH and MP were responsible for the research conception and design, data collection, and securing funding. DC, SKS, GK, and RH performed the analysis. DC wrote the first draft of the manuscript and DC and KB completed the literature review. All authors contributed to the revision and approved the final manuscript for publication.

that boys with greater substance use may need particularly intensive support to initiate quit attempts.

INTRODUCTION

While studies have identified predictors of adolescent smoking cessation, few have focused on understanding barriers to making cigarette-quit attempts.¹ Similar to adults,² young smokers may need quit attempts to gain specific skills necessary to achieve abstinence.³ Males are less likely to attempt quitting than females,⁴ but reasons for this disparity remains largely unknown. More adolescent smokers (versus non-smokers) use alcohol and marijuana,⁵ and rates of substance use are generally higher in adolescent boys than girls.⁶ As other substance (marijuana,⁷ alcohol^{8–10}) use and gender may influence smoking cessation,⁴ understanding roles of co-occurring substance use and gender in adolescent cigarette-quit attempts may help clinicians better assist adolescents in smoking cessation.

To our knowledge, one study has evaluated substance use-related predictors of cigarette-quit attempts in adolescents;¹¹ this study observed that adolescent daily smokers with and without prior quit attempts did not differ on alcohol- or marijuana-use measures. However, this study focused on daily smokers. As most adolescent smokers are non-daily or sporadic smokers¹² and this group reports difficulty in quitting smoking,¹³ a deeper understanding of factors promoting quit attempts in more representative samples of adolescent smokers is needed.

This study evaluated: 1) whether the frequency of marijuana or alcohol use is associated with past cigarette-quit attempts, separately for boys and girls, and 2) whether gender-related differences exist in associations between substance-use behaviors and past cigarette-quit attempts. As frequency of co-occurring substance use has predicted poorer smoking-cessation outcomes in adults,¹⁴ we hypothesized that more frequent alcohol- or marijuana-use would decrease the likelihood of past cigarette-quit attempts. Given gender-related differences in quit attempts and co-morbid substance use, we hypothesized that adolescent boys using marijuana or alcohol would be less likely to have made quit attempts. Understanding gender differences in the relationship between cigarette quit attempts and engagement in other substances may help elucidate gender differences in smoking cessation rates and inform clinical interventions that encourage adolescents to quit smoking.

METHODS

This secondary analysis investigated cross-sectional, self-report survey data from adolescents attending ten Connecticut non-vocational and non-special-education high schools as described previously^{15–18} and detailed in supplementary materials. The study was approved by the Yale University Institutional Review Board.

Population

The survey was completed by 4,523 adolescents, with <1% refusal. The current sample consisted of 804 current smokers (smoking at least one cigarette/day in the past 30 days).

Measures

Demographic variables included grade, race/ethnicity (White, African-American, Hispanic/Latino, and Asian/other), and district-reference group (DRG). Smoking characteristics included cigarettes-smoked/day and age of initiation of daily smoking.

Cigarette-quit attempt status was the dependent variable and determined using the answer to the question “How many times you have tried to stop smoking?” A 2-level quit-status variable was created: 1 versus 0 cigarette-quit attempts.

Marijuana use, alcohol use and binge drinking were determined using the questions: “In the past 30 days, how many times did you smoke marijuana?” (0 times; 1 or 2; 3–5, 6–9; 10–19; 20–39; 40+), “In the past 30 days, how many days did you have at least one whole drink of alcohol?” (0, 1 or 2, 3–5, 6–9, 10–19, 20–29, all 30 days), and “In the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?” (0, 1 or 2, 3–5, 6–9, 10–19, 20–29, all 30 days).

Adolescents were stratified into three groups based on their pattern of marijuana consumption: non-users, lower-frequency users, and higher frequency users. Non-users reported no marijuana use in the past 30 days. The remaining adolescents who reported at least 1 episode of marijuana use in the past 30 days, were dichotomized into lower-frequency users (1–5 times in the past 30 days) and higher-frequency users (greater than 6 times in the past 30 days) based on the distribution of the data for marijuana.

Adolescents were stratified into four groups for alcohol consumption: non-drinkers, non-binge drinkers, binge drinkers, and frequent binge drinkers. We first identified adolescents with no alcohol use in the past 30 days (non-drinkers). We defined non-binge drinkers to be adolescents who consumed at least one drink of alcohol without a binge pattern in the past 30 days. The remaining adolescents, who reported binge drinking (5 or more drinks per occasion), were dichotomized into binge drinkers and frequent binge drinkers. Binge drinkers were those who consumed 5 or more drinks on at least one day but no more than 5 days in the past 30 days and frequent binge drinkers were those who consumed 5 or more drinks per occasion on 6 or more days in the past 30 days.

Statistical Analysis

Demographic characteristics (grade, race/ethnicity, DRG) and smoking behaviors (age at smoking initiation, cigarettes-smoked/day, number of cigarette-quit attempts) were compared, stratified by gender. We compared the prevalence of co-occurring marijuana, alcohol, or binge-drinking between genders, stratified by cigarette-quit-attempt status. We used Cochran Mantel-Haentzel tests, including Breslow Day tests, to determine whether the relationship between each gender and each variable was different.

Separate logistic regression models were fit to describe the association between each substance-use behavior and cigarette-quit-attempt status. In each logistic model, cigarette-quit-attempt status was the dependent variable and the substance-use variable was the primary independent variable. Models were adjusted for cigarettes-smoked/day, age of smoking initiation, gender, white/other race, and grade. *A priori* interaction terms (gender-

by-marijuana and gender-by-alcohol) were fit to determine whether associations were significantly different in boys and girls. For each substance, separate models were created for boys, girls, and the total sample and model fit indices, including c-statistics and McFadden's likelihood ratio index,¹⁹ were reported. Analyses were conducted using SAS 9.2 (SAS Institute, Cary, NC).

RESULTS

Current smokers (n=804) comprised 17.7% of the sample (n=4,523). Smokers were predominantly female (56.7%) and white (82.8%), with more girls reporting white race than boys (86.0% vs. 78.7%; $p=0.02$) (Table 1). Numbers of cigarette-quit attempts did not differ between genders ($p=0.6$), and 48.3% of smokers reported no prior cigarette-quit attempts. More boys than girls reported marijuana use (75.6% vs. 61%; $p<0.001$) and concurrent use of marijuana and alcohol (67.5% vs. 59.4%; $p<0.001$).

A larger proportion of boys smoke > 18 cigarettes/day (31.3% vs. 9.4%; $p<0.0001$) and started smoking early (26.7% vs. 16.9% age <12 years; $p<0.0001$) (Table 2). More boys than girls reported higher-frequency marijuana-use (48.3% vs. 22.1%; $p=0.001$). Both boys and girls had similar proportions of non-drinkers, non-binge-drinkers, binge-drinkers and frequent-binge-drinkers ($p=0.2$).

Adjusted odds describing associations between cigarette-quit-attempt status and substance use are shown (Table 3; See Supplementary Materials for full models). Age of cigarette smoking initiation and frequency of cigarette use were predictive of quit attempts (see Supplementary Materials). In models adjusted for age of cigarette initiation, frequency of cigarette use, race, grade, and gender, frequent binge-drinking (AOR=0.49; 95%CI=0.29–0.83) and higher-frequency marijuana-use (AOR=0.56; 95%CI=0.36–0.86) were associated with decreased odds of past cigarette-quit attempts (Table 3). A significant interaction existed between higher-frequency marijuana-use and gender in predicting cigarette-quit attempts ($p=0.03$), with decreased odds in boys (AOR=0.41; 95%CI=0.22–0.77) but not girls (AOR=0.71; 95%CI=0.37–1.33). Interactions for gender and alcohol use were not significant, although frequent binge-drinking was associated with decreased odds of quitting in girls (AOR=0.29; 95%CI=0.13–0.66) but not boys.

DISCUSSION

In support of our initial hypothesis, higher-frequency marijuana-use and frequent binge-drinking were associated with decreased odds of a past cigarette-quit attempt in adolescent smokers. Partially consistent with our second hypothesis, boys (versus girls) who reported higher-frequency marijuana-use were less likely to report cigarette-quit attempts. This gender-related finding may relate to boys being more likely to report substitution between cigarettes and marijuana (especially in public).²⁰ This substitution may allow boys' marijuana use to reinforce cigarette behaviors, as both substances have similar delivery devices and habits surrounding their use.²¹ Adolescent boys with higher-frequency marijuana-use may also perceive little harm from either substance,²² and thus be less interested in quitting smoking.

Similar to adults,^{8, 14} adolescent smokers reporting frequent-binge-drinking (compared to non-drinkers) had a decreased likelihood of reporting cigarette-quit attempts. Frequent-binge-drinkers may place less value on the health and social consequences of alcohol and cigarette use. Additionally, use of one substance may enhance positive effects of the other,^{23, 24} leading to more frequent use of both and decreased interest in quitting smoking.

The absence of a significant interaction in the association between frequent binge drinking and quit attempts suggests that the behavioral and social influences that support concurrent binge drinking and cigarettes use may not affect boys and girls differently. For example, the “partying” culture supporting the co-occurring use of alcohol and cigarettes²⁴ may be relatively gender-neutral and support similar behaviors across genders. A statistically significant relationship between frequent binge-drinking and cigarette-quit attempts was observed in girls but not boys. This raises the possibility that girls may be more likely to experience positive effects of concurrent alcohol and cigarette use or have different smoking patterns while drinking which may lead to more dependence. Future research is needed to investigate further.

Limitations

Data were self-reported and collected during the academic semester, which may have resulted in underreporting in the school setting and may not be representative of tobacco, alcohol and marijuana use patterns during vacations/summer months.^{25,26, 27} The cross-sectional design limits inferences regarding causality. We did not determine the length of each quit attempt, although restricting cigarette-quit attempts to those lasting greater than 24 hours may underestimate the true prevalence of quit attempts.²⁸ Generalizability may be limited by relative racial homogeneity (83% white sample). Despite low refusal, frequently absent or truant students may be under-represented. Data were collected in 2006 and may not reflect recent substance-use patterns. Power was limited in identifying gender-related interactions. The across-gender-similar binge-drinking definition may have underestimated binge-drinking in females.

Conclusions

Higher-frequency marijuana-smoking and frequent-binge-drinking are associated with decreased likelihoods of making cigarette-quit attempts in adolescent smokers. Boys reporting higher-frequency marijuana-use have a lower likelihood of quit attempts. The findings can be used to improve existing smoking-cessation and substance-use-treatment strategies by identifying individuals who may need enhanced support to make cigarette-quit attempts. The data suggest that adolescent male smokers engaging in higher-frequency marijuana-smoking may need particularly intensive support to initiate quit attempts. Furthermore, treatment programs should consider focusing on encouraging abstinence from both cigarettes and marijuana among boys, as the co-occurrence of these behaviors may reinforce each other and decrease the likelihood of cigarette quit attempts.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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References

1. Ellickson PL, Tucker JS, Klein DJ. Sex differences in predictors of adolescent smoking cessation. *Health Psychol.* 2001; 20(3):186–195. [PubMed: 11403216]
2. Fiore, MC.; Jaen, CR.; Baker, TB., et al. Clinical Practice Guideline. Rockville, MD: U.S. Department of Health and Human Services. Public Health Services; May. 2008 Treating Tobacco Use and Dependence: 2008 Update.
3. Moolchan ET, Aung AT, Henningfield JE. Treatment of adolescent tobacco smokers: Issues and opportunities for exposure reduction approaches. *Drug and Alcohol Dependence.* 2003; 70(3):223–232. [PubMed: 12757960]
4. Rose JS, Chassin L, Presson CC, Sherman SJ. Prospective predictors of quit attempts and smoking cessation in young adults. *Health Psychol.* 1996; 15(4):261–268. [PubMed: 8818672]
5. Camenga DR, Klein JD, Roy J. The changing risk profile of the American adolescent smoker: implications for prevention programs and tobacco interventions. *J Adolesc Health.* 2006; 39(1): 120.e121–110. [PubMed: 16781972]
6. Cotto JH, Davis E, Dowling GJ, et al. Gender effects on drug use, abuse, and dependence: A special analysis of results from the national survey on drug use and health. *Gend Med.* 2010; 7(5):402–413. [PubMed: 21056867]
7. Gourlay SG, Forbes A, Marriner T, Pethica D, McNeil JJ. Prospective study of factors predicting outcome of transdermal nicotine treatment in smoking cessation. *BMJ (Clinical Research Ed).* 1994; 309(6958):842–846.
8. John U, Meyer C, Rumpf HJ, Hapke U. Probabilities of alcohol high-risk drinking, abuse or dependence estimated on grounds of tobacco smoking and nicotine dependence. *Addiction.* 2003; 98(6):805–814. [PubMed: 12780369]
9. Berg CJ, Ling PM, Hayes RB, et al. Smoking frequency among current college student smokers: distinguishing characteristics and factors related to readiness to quit smoking. *Health Educ Res.* 2012; 27(1):141–150. [PubMed: 22156071]
10. Jaszyna-Gasior M, Schroeder JR, Moolchan ET. Alcohol use and tobacco abstinence among adolescents in cessation treatment: preliminary findings. *Addict Behav.* 2007; 32(3):617–621. [PubMed: 16814935]
11. Abrantes AM, Lee CS, MacPherson L, et al. Health risk behaviors in relation to making a smoking quit attempt among adolescents. *J Behav Med.* 2009; 32(2):142–149. [PubMed: 19003525]
12. Centers for Disease Control and Prevention. Youth Risk Behavior Surveillance -- United States, 2011. *MMWR Morb Mortal Wkly Rep.* 2012; 61(SS04):1–162.
13. Rubinstein ML, Rait MA, Sen S, Shiffman S. Characteristics of adolescent intermittent and daily smokers. *Addict Behav.* 2014; 39(9):1337–1341. [PubMed: 24837757]
14. Osler M, Prescott E, Godtfredsen N, Hein HO, Schnohr P. Gender and determinants of smoking cessation: a longitudinal study. *Prev Med.* 1999; 29(1):57–62. [PubMed: 10419801]
15. Schepis TS, Desai RA, Smith AE, et al. Impulsive Sensation Seeking, Parental History of Alcohol Problems, and Current Alcohol and Tobacco Use in Adolescents. *J Addict Med.* 2008; 2(4):185–193. [PubMed: 19956365]
16. Schepis TS, Desai RA, Cavallo DA, et al. Gender differences in adolescent marijuana use and associated psychosocial characteristics. *J Addict Med.* 2011; 5(1):65–73. [PubMed: 21769049]
17. Desai RA, Krishnan-Sarin S, Cavallo D, Potenza MN. Video-gaming among high school students: Health correlates, gender differences, and problematic gaming. *Pediatrics.* 2010; 126(6):e1414–1424. [PubMed: 21078729]

18. Potenza MN, Wareham JD, Steinberg MA, et al. Correlates of at-risk/problem internet gambling in adolescents. *J Am Acad Child Adolesc Psychiatry*. 2011; 50(2):150–159. e153. [PubMed: 21241952]
19. McFadden, D. Conditional logit analysis of qualitative choice behavior. In: Zarembka, P., editor. *Frontiers in Economics*. New York: Academic Press; 1974.
20. Timberlake DS. A comparison of drug use and dependence between blunt smokers and other cannabis users. *Subst Use Misuse*. 2009; 44(3):401–415. [PubMed: 19212929]
21. Hight G. The role of cannabis in supporting young people's cigarette smoking: A qualitative exploration. *Health Educ Res*. 2004; 19(6):635–643. [PubMed: 15199002]
22. Cavazos-Rehg PA, Krauss MJ, Spitznagel EL, Grucza RA, Bierut LJ. Youth tobacco use type and associations with substance use disorders. *Addiction*. 2014
23. Harrison ELR, Hinson RE, McKee SA. Experimenting and daily smokers: episodic patterns of alcohol and cigarette use. *Addict Behav*. 2009; 34(5):484–486. [PubMed: 19176271]
24. Nichter M, Carkoglu A, Lloyd-Richardson E. Smoking and drinking among college students: "It's a package deal". *Drug Alcohol Depend*. 2010; 106(1):16–20. [PubMed: 19758771]
25. Patrick DL, Cheadle A, Thompson DC, et al. The validity of self-reported smoking: a review and meta-analysis. *Am J Public Health*. 1994; 84(7):1086–1093. [PubMed: 8017530]
26. Colwell B, Ramirez N, Koehly L, et al. Seasonal variations in the initiation of smoking among adolescents. *Nicotine Tob Res*. 2006; 8(2):239–243. [PubMed: 16766416]
27. Kovalenko PA, Hoven CW, Wicks J, et al. Seasonal variations in internalizing, externalizing, and substance use disorders in youth. *Psychiatry Res*. 2000; 94(2):103–119. [PubMed: 10808036]
28. Hughes JR, Carpenter MJ, Naud S. Do point prevalence and prolonged abstinence measures produce similar results in smoking cessation studies? A systematic review. *Nicotine Tob Res*. 2010; 12(7):756–762. [PubMed: 20504946]

TABLE 1

Sample Demographics, Quit Attempts, and Substance Use

	Total, n (%) (n=804)	Males, n (%) (n=348)	Females, n (%) (n=456)	p-value
Grade				0.4
9	182 (22.6)	88 (25.3)	94 (20.6)	
10	200 (24.9)	86 (24.7)	114 (25.0)	
11	247 (30.7)	100 (28.7)	147 (32.2)	
12	171 (21.3)	74 (21.3)	97 (21.3)	
Missing	4 (0.5)	0 (0)	4 (0.9)	
Race/Ethnicity				
White	666 (82.8)	274 (78.7)	392 (86.0)	0.007
Black	48 (6.0)	27 (7.8)	21 (4.6)	0.06
Hispanic/Latino	108 (13.4)	48 (13.8)	60 (13.2)	0.8
Other	49 (6.1)	29 (8.3)	20 (4.4)	0.02
District Reference Group ^d				0.13
Tier I (highest)	133 (16.5)	67 (19.3)	66 (14.5)	
Tier II	457 (56.8)	185 (53.2)	272 (59.6)	
Tier III (lowest)	214 (26.6)	96 (27.6)	118 (25.9)	
Number of Quit Attempts				0.6
0	388 (48.3)	177 (50.9)	211 (46.3)	
1	147 (18.3)	59 (17.0)	88 (19.3)	
2	115 (14.3)	46 (13.2)	69 (15.1)	
3+	154 (19.2)	66 (19.0)	88 (19.3)	
Current ^b marijuana use	541 (67.3)	263 (75.6)	278 (61.0)	<0.001
Current alcohol use	685 (85.2)	290 (83.3)	395 (86.6)	0.19
Current binge drinking	553 (68.8)	252 (72.4)	301 (66.0)	0.05
Current alcohol and marijuana use	493 (61.3)	235 (67.5)	257 (56.4)	<0.001

^aDistrict reference groups were grouped into 3 tiers. DRGs classify schools based on the socioeconomic status of the families in the school district. We sampled from each of the 3 tiers of DRGs to create a more socioeconomically representative sample.

^bCurrent users report use at least 1 time/day in the past month

TABLE 2

Characteristics of Adolescent Smokers By Gender and Cigarette-Quit Status

Variable	Boys (n=348) n (%)				Girls (n=456) n (%)				Boys vs. Girls	
	Total Boys (n=348)	0 Quit Attempts (n=177)	1+ Quit Attempts (n=171)	p ^a	Total Girls (n=456)	0 Quit Attempts (n=211)	1+ Quit Attempts (n=245)	p ^a	p ^b	
Cigarettes Smoked per Day										
<1	83 (23.9)	58 (32.8)	25 (14.6)	<0.001	129 (28.3)	97 (46.0)	32 (13.1)	<0.001	<0.001	
1 to 7	104 (29.9)	54 (30.5)	50 (29.2)		174 (38.2)	72 (34.1)	102 (41.6)			
8 to 17	52 (14.9)	16 (9.0)	36 (21.1)		110 (24.1)	28 (13.3)	82 (33.5)			
18+	109 (31.3)	49 (27.7)	60 (35.1)		43 (9.4)	14 (6.6)	29 (11.8)			
Age Started Smoking Daily										
Never smoked daily	76 (21.8)	58 (32.8)	18 (10.5)	<0.001	141 (30.9)	118 (55.9)	23 (9.4)	<0.001	<0.001	
<12	93 (26.7)	52 (29.4)	41 (24.0)		77 (16.9)	18 (8.5)	59 (24.1)			
13–14	85 (24.4)	20 (11.3)	65 (38.0)		137 (30.0)	33 (15.6)	104 (42.4)			
15+	92 (26.4)	46 (26.0)	46 (26.9)		101 (22.1)	42 (19.9)	59 (24.1)			
Missing	2 (0.6)	1 (0.6)	1 (0.6)		0 (0.0)	0 (0.0)	0 (0.0)			
Current Alcohol Use										
Frequent Binge Drinkers (binge drank 6+ days in past 30 days)	119 (34.2)	63 (35.6)	56 (32.7)	0.6	109 (23.9)	52 (24.6)	57 (23.3)	0.4	0.2	
Binge Drinkers (binge drank 1–5 days in past 30 days)	133 (38.2)	65 (36.7)	68 (39.8)		192 (42.1)	83 (39.3)	109 (44.5)			
Non-Binge Drinkers (at least 1 drink of alcohol in \ past 30 days, no binge)	38 (10.9)	22 (12.4)	16 (9.4)		94 (20.6)	50 (23.7)	44 (18.0)			
Non-Drinkers	58 (16.7)	27 (15.3)	31 (18.1)		61 (13.4)	26 (12.3)	35 (14.3)			
Current Marijuana Use										
High-Frequency Users (6+ times in past 30 days)	168 (48.3)	90 (50.8)	78 (45.6)	0.1	101 (22.1)	31 (14.7)	70 (28.6)	0.001	0.06	
Low-Frequency Users (1 to 5 times in past 30 days)	95 (27.3)	52 (29.4)	43 (25.1)		177 (38.8)	93 (44.1)	84 (34.3)			
Non-User	85 (24.4)	35 (19.8)	50 (29.2)		178 (39.0)	87 (41.2)	91 (37.1)			

^a Chi-square test^b Cochran-Mantel-Haenszel tests were used to examine each variable and quit status, comparing the groups of boys and girls.

c, Categories for cigarettes smoked/day were presented as quartiles of the data for the entire sample.

TABLE 3

Adjusted Odds Ratios for Cigarette-Quit Attempts Among Adolescent Smokers

Substance Use Behavior	Total ^a			Boys ^b			Girls ^b			Boys vs. Girls
	OR	LCI	UCI	OR	LCI	UCI	OR	LCI	UCI	
Current alcohol use										
Frequent Binge Drinkers (<i>binge drank 6+ days in past 30 days</i>)	0.49	0.29	0.83	0.72	0.35	1.45	0.29	0.13	0.66	2.48 p=0.52
Binge Drinkers (<i>binge drank 1–5 days in past 30 days</i>)	0.94	0.58	1.54	1.10	0.55	2.19	0.67	0.32	1.41	1.64 p=0.41
Non-Binge Drinkers (<i>at least 1 drink of alcohol in past 30 days, no binge</i>)	0.70	0.39	1.25	0.82	0.33	2.04	0.52	0.23	1.20	1.57 p=0.65
Non-Drinkers	Ref.			Ref.			Ref.			
c-statistic	0.77			0.74			0.87			0.78
Likelihood ratio index	0.18			0.13			0.26			0.18
Current marijuana use										
High-Frequency Users (<i>6+ times in past 30 days</i>)	0.56	0.36	0.86	0.41	0.22	0.77	0.71	0.37	1.33	0.58 p=0.03
Low-Frequency Users (<i>1 to 5 times in past 30 days</i>)	0.68	0.46	1.02	0.56	0.29	1.09	0.77	0.46	1.28	0.73 p=0.3
Non-User	Ref.			Ref.			Ref.			
c-statistic	0.77			0.75			0.81			0.77
Likelihood ratio index	0.17			0.14			0.24			0.17

OR=Odds Ratio; LCI=Lower bound of 95% Confidence Interval; UCI=Upper bound of 95% Confidence Interval; Ref= Reference Group

^a Adjusted for cigarettes smoked per day, age started smoking daily, white race/other race, grade and sex^b Adjusted for cigarettes smoked per day, age started smoking daily, white/other race and grade