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Flavored Cannabis Use and Cannabis-Tobacco Co-use: Patterns In U.S. States With Legalized Nonmedical Adult Use

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Abstract

Introduction: Little is known about inhaled flavored cannabis use. This study aimed to investigate the prevalence and patterns of flavored cannabis use and cannabis-tobacco co-use.

Methods: This study surveyed adult past 30-day cannabis users in US states and districts that have legalized cannabis for non-medical/adult use (n=9) (November 2018; n=2,978). By product/behavior (any cannabis, cannabis extract vaporizers, mixed cannabis-nicotine vaporizers, blunts, chasing) the association between flavored (vs. non-flavored) use and sociodemographic characteristics, cannabis use disorder symptoms, and tobacco use was estimated using weighted multivariable logistic regression in January, 2022.

Results: Almost half of adult cannabis users reported using at least one flavored cannabis product (46.5%). Flavored cannabis use was more likely among respondents who were female

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Credit Author Statement

Shannon Lea Watkins: Conceptualization, Methodology, Validation, Formal Analysis, Investigation, Writing – Original Draft Preparation, Writing – Review & Editing, Visualization, Supervision, Project Administration. **Jesse Thompson:** Software, Formal Analysis, Investigation, Data Curation, Writing – Original Draft Preparation, Writing – Review & Editing, Visualization. **Ashley L Feld:** Conceptualization, Investigation, Writing – Review & Editing. **Pamela M Ling:** Conceptualization, Investigation, Writing – Review & Editing. **Youn Ok Lee:** Conceptualization, Investigation, Resources, Writing – Review & Editing, Supervision, Project Administration, Funding Acquisition.

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(AOR: 1.2; CI: 1.0, 1.4), Black (ref: White; AOR: 2.2; CI: 1.5, 3.1), Hispanic/Latinx (ref: White; AOR: 1.6; CI: 1.2, 1.9), had cannabis use disorder symptoms (AOR: 2.0; CI: 1.6, 2.4) or current tobacco use (AOR: 2.4; CI: 2.1, 2.9). Use was less likely among middle-aged/older adults (ref: 21–34 vs. 35–49; AOR: 0.6; CI: 0.5, 0.7).

Conclusions: Observed differences in flavored cannabis use are concerning if flavors raise appeal or dependence. Integrating flavored cannabis and tobacco research and practice is warranted.

Keywords

marijuana use; recreational marijuana legalization; substance use

INTRODUCTION

Approximately 42.8 million US adolescents and adults (17.5%) used cannabis in 2019.¹ The legalization of adult use cannabis in US states and districts (herein: legalized cannabis) has accelerated cannabis market diversification, as existing cannabis products are commercially produced and distributed and new products like disposable vaporizers emerge.² Cannabis products range in form, delivery mechanism, cannabinoid concentration, and advertised psychoactive and physical effects,^{3,4} and people in states with legalized cannabis report a wider array of consumption methods.^{5,6}

In addition to cannabis' inclusion in food and drinks, inhaled cannabis products are marketed with flavors, tastes, and smells, including flavored CBD vaporizers⁷ and flower strains with fruity or sweet sensory profiles³ that echo flavored tobacco marketing.^{8–10} Flavors in tobacco products decrease harm perception^{11,12} and increase product appeal^{13–16} and nicotine dependence.¹⁷ Flavors in inhaled cannabis products might similarly impact initiation or dependence. For example, flavor in blunts (i.e., hollowed-out tobacco leaf wrappers typically from cigars filled with marijuana) might reduce risk perceptions¹⁸ and increase appeal.^{19–21} Furthermore, flavors in cannabis extract vaporizers can reduce aerosol odors facilitating concealment,²² which has enhanced e-cigarette appeal.²³ Yet, vaping with flavors might be less common for cannabis than nicotine,^{24–26} and unlike tobacco products, cannabis products with flavor descriptors do not necessarily include flavor additives.

Methods for using cannabis and tobacco/nicotine together (i.e., co-use) further complicate flavored cannabis study. Flavored tobacco products are used with cannabis, for example via flavored blunt wraps or “chasing” cannabis smoking with menthol cigarettes. Increasing popularity of flavored e-cigarettes and cigars²⁷ might also increase flavored cannabis consumption.²⁸ Indeed, flavored cigars are more popular in states with legalized cannabis than in states without.²⁹ Furthermore, the co-evolution of the cannabis and tobacco markets has produced new e-cigarettes and cigars that facilitate co-use,^{22,30} Although difficult to measure, co-use is increasing in the US.³¹ About 10% of young adults (men: 12.9%; women: 6.8%) use both substances,³² and in California, about 6.1% of all adults use both. More than half of adult cannabis users report also using tobacco,^{31,33} and in California, over a third reported using both products simultaneously (i.e., co-administered via shared delivery method).³³ Co-use might pose higher health risks, including higher toxicant exposure,³⁴

mental health problems,^{32,35} and dependence,^{36,37} than using either substance alone.³⁸ Flavored tobacco products might facilitate co-use and related risks. Inhaled cannabis is still largely consumed via combusted products,³⁹ so flavored combusted tobacco products likely contribute substantially to consumption of cannabis with flavors.

Despite rich evidence about flavored tobacco product use, little is known about inhaled flavored cannabis use. Flavored e-cigarettes, cigars, and cigarettes (menthol) are most popular among adolescents and young adults,^{40,41} and the same may be true for inhaled flavored cannabis. Cannabis chasing may mirror racial disparities in menthol cigarette use.^{41,42} If flavored cannabis products are more popular in populations with tobacco use disparities, proliferation of flavored cannabis products may exacerbate these disparities.

This study investigated prevalence and patterns of inhaled flavored cannabis use and cannabis-tobacco co-use with a cross-sectional dataset of adult (≥ 21) cannabis users in US states and districts with legalized cannabis for non-medical/adult use to inform developing cannabis policy.

METHODS

Study Sample

In November 2018, this study surveyed 3,000 adults (≥ 21) who had used cannabis in the past 30 days and resided in nine US states and districts that had legalized cannabis for non-medical/adult use (i.e., “recreational cannabis use”): California, Nevada, Oregon, Washington, Colorado, Maine, Massachusetts, Alaska, and District of Columbia. Respondents reported past-30-day flavored product use, cannabis use motivations, cannabis and nicotine dependence, alcohol use, overall health, and sociodemographic characteristics. The sample was obtained from an online Kantar panel. All participants provided informed consent. RTI International’s Institutional Review Board approved the protocol.

Measures

Past 30-day cannabis users reported use of specific cannabis and tobacco products. Past 30-day use measures were created for cannabis and co-use products that have at least some flavored products available: cannabis vaporizers with concentrate, wax, or oil (herein: cannabis extract vaporizer); edible cannabis, blunts, co-use vaporizers (i.e., vaporizer used to vape mixed cannabis and nicotine liquid), and chasing (i.e., vaped nicotine or smoked a cigarette, cigar, or cigarillo after vaping or smoking cannabis to enhance a cannabis high).

Respondents were also classified as past 30-day users of cigarettes; cigars, cigarillos, or little cigars (herein: cigars); chewing tobacco, moist snuff, dip, or snus (herein: smokeless tobacco); e-cigarettes; and waterpipe or hookah (herein: hookah). An aggregate tobacco use variable indicated past-30-day use of any product.

Binary measures of cannabis used with flavor (herein: flavored cannabis use) were created for cannabis extract vaporizers, blunts, co-use vaporizers, and chasing. All edible cannabis use was considered flavored. Flavored use was assessed slightly differently across product type to accommodate product differences (see Online Appendix Figure 1 for details).

Cannabis extract vaporizer flavor refers to the flavor of the cannabis concentrate, wax, or oil vaped; co-use vaporizer flavor refers to the flavor of the nicotine liquid mixed with cannabis. For both extract and co-use vaporizers, users indicated usual flavors from a list: menthol or mint, clove or spice, fruit, chocolate, an alcoholic drink, a non-alcoholic drink; candy, desserts, or other sweets; regular tobacco, and some other flavor. Blunt smokers indicated the flavor of their regular brand of cigar, cigarillo, or blunt wrap used to smoke blunts. For extract vaporizer, co-use vaporizer, and blunt users, those who indicated using menthol or mint; clove or spice; fruit; chocolate; alcoholic drink; non-alcoholic drink; and/or candy, desserts or other sweets were classified as users of flavors; for co-use vaporizer and blunts, “some other flavor” was also coded as flavored use. “Flavored chasing” was identified if respondents used a menthol-flavored cigarette, cigar or e-cigarette after smoking/vaping cannabis some or every time they chased. Other responses were categorized as “non-flavored”.

For blunt, cannabis extract vaporizer, and/or co-use vaporizer use, significant flavor categories were identified using the tobacco literature and cannabis market knowledge⁴³ and three dummy variables indicated whether respondents used sweet (combining chocolate, candy, and dessert), fruit, and menthol/mint products.

Finally, an aggregated “any inhaled flavored cannabis” variable indicated whether a respondent had used flavored extract vaporizers, co-use vaporizers, and/or blunts. This variable included co-administrated products (e.g., blunts) but not sequenced co-use (i.e., chasing) because the flavor of the latter was not part of a product containing cannabis. With no variation in flavored status, edible cannabis use was not included in the aggregate measure. The literature dedicated to the use of edibles can better illuminate drivers of their use.^{44,45}

Past 30-day cigar, smokeless tobacco, and hookah use was considered flavored if the respondent reported a regular brand flavored to taste like menthol, mint, clove, spice, fruit, chocolate, alcohol, candy, or other sweets. Flavored cigarette smoking was classified if the respondent’s regular brand of cigarettes was menthol or mint. Flavored e-cigarette use was classified if respondents reported any usual e-liquid flavor other than (or in addition to) regular tobacco. An aggregate measure indicated the use of any flavored tobacco.

The following sociodemographic variables were measured: sex, age, race/ethnicity, and education level (see definitions in Table 1). Cannabis dependence was measured by computing respondents’ overall index score on the 8-item Cannabis Use Disorder Identification Test – Revised (CUDIT-R).⁴⁶ Each item ranged from 0–3, and a score of 12 or more indicated cannabis use disorder symptoms.

Statistical Analysis

First, prevalence estimates were calculated for use of each cannabis and tobacco product, flavored use for each product, and use of specific flavors (sweet, fruit, menthol/mint) for cannabis extract vaporizers, blunts, and co-use vaporizers. Second, for each cannabis product, logistic regression estimated differences in respondent sociodemographic characteristics, cannabis use disorder symptoms, and tobacco use between flavored and

non-flavored product users. Finally, univariate logistic regression estimated whether flavored cannabis use and flavored tobacco use were associated for users of both products for five cannabis-tobacco combinations with similar routes of delivery: cannabis vaporizers and e-cigarettes, co-use vaporizers and e-cigarettes, blunts and cigars, chasing and cigarettes, and chasing and e-cigarettes.

RESULTS

Analyses were conducted in January 2022 using Stata 16.0 and included the 2,978 respondents who passed survey attention checks. The sample was nearly balanced in sex (male: 47.9%, female: 51.5%; another: 0.6%) (Table 1). Thirty-six percent of respondents were 21 to 34 years old (age 35–49: 27.4%, 50–64: 24.4%, 65+: 11.8%). Seventy-one percent of respondents were White (Black: 5.1%, another race/ethnicity 8.7%; Hispanic/Latinx: 15.3%); less than half had at least a bachelor's degree (39.5%).

Analysis used calibration weighting to align the sample with demographic benchmarks (state, sex, race, age, and education) of U.S. cannabis users from CDC's 2016 and 2017 Behavioral Risk Factor Surveillance System (BRFSS). The unweighted sample was roughly consistent with 2020 National Surveys of Drug Use and Health (NSDUH) data, although compared to NSDUH estimates, the weighted sample likely over-represented White cannabis users and under-represented cannabis users who are another race or ethnicity or over 65 years old.⁴⁷

For each product, Table 2 reports overall prevalence and flavored product use among those users. Edibles were most used (57.2%), followed by blunts (48.0%) and cannabis extract vaporizers (47.2%). Over half of the respondents reported chasing cannabis with cigarettes/e-cigarettes (51.9%), and fewer reported co-using via vaporizer (15.9%).

Flavored use was common. Almost half of the respondents (46.5%) reported using at least one flavored cannabis product; 77.3% of co-use vaporizer users, 74.7% of respondents who chased, 63.4% of blunt users, and 59.9% of extract vaporizer users reported using flavors.

Among the three flavor categories, fruit was most popular for extract vaporizers (35.6%) and blunts (27.4%), and menthol/mint was most popular for co-use vaporizers (35.4%) (Table 3).

Table 4 reports adjusted associations between flavored cannabis product use and sociodemographic and behavioral indicators. Young respondents (21–34) were more likely to report any flavored cannabis use than older respondents. In product-specific models, age group was inversely related to flavored extract vaporizer use (age 50–64; 65+ vs. 21–34) and chasing (age 50–64) and was not associated with flavored use of blunts or co-use vaporizers. Female respondents were more likely to report any flavored cannabis, blunt, and co-use vaporizer use (ref: male).

Black and Latinx respondents were more likely to report flavored cannabis use than White respondents. Menthol chasing was significantly more likely among all racial and ethnic minority groups, and Latinx users were also more likely to use flavored cannabis vaporizers

and less likely to use flavored blunts (ref: White users). Education was largely unassociated with flavor use, although positively associated with menthol chasing.

Flavored cannabis use and chasing were significantly higher for both respondents with cannabis use disorder symptoms and past 30-day tobacco use. Tobacco use was also positively associated with flavored extract vaporizer use (but not co-use vaporizer use) and negatively associated with flavored blunt use.

Among co-users, flavored tobacco and flavored cannabis use were significantly associated (OR=4.71; $p<0.001$). Among co users of tobacco and cannabis products with a shared delivery mechanism, there was a positive association between use of the flavored nicotine product and the flavored cannabis/co-use product for three of five combinations: e-cigarettes and cannabis vaporizers (OR=8.37; $p<0.001$), e-cigarettes and co-use vaporizers (OR=45.17; $p<0.001$), and cigarettes and chasing (OR=15.71; $p<0.001$). In contrast, flavored cigar use and flavored blunt use were not significantly associated (OR=1.27; $p=0.336$); neither were flavored e-cigarette use and flavored chasing (OR=1.65; $p=0.074$).

DISCUSSION

This study reports patterns and predictors of inhaled cannabis with flavor, cannabis co-administered with flavored tobacco, and cannabis sequenced with flavored tobacco in a large sample of adult cannabis users residing where cannabis is legal for non-medical/adult use. It found that inhaled flavored cannabis use is common; almost half of the sample reported using a flavored cannabis product. In addition, it found higher flavored cannabis use among younger adults, females, and Black and Latinx cannabis users, raising health equity concerns. There was significantly higher flavored cannabis use among users with cannabis use disorder symptoms and among past 30-day tobacco users, concerning associations if flavored cannabis facilitates dependence or ongoing tobacco use.

The observed age gradient, with younger cannabis users (aged 21–34) more likely to report flavored cannabis use, is consistent with concerns that flavors attract young people. For some product-specific models this gradient is not statistically significant, which might be an artifact of sample size or might suggest that age differences in flavored cannabis use are driven by differences in products used. These findings are consistent with recent evidence that California adolescents both smoke and vape flavored cannabis,²⁶ suggesting that flavored cannabis appeals to both adolescents and adults.

This study found significantly higher flavored cannabis use among women than men. Co-use with tobacco might account for most of the flavored cannabis use among women, consistent with prior reports of higher flavored cigar use among female cigar^{19,48} and menthol cigarette users⁴⁹ than male users. Efforts to eliminate flavored tobacco products might reduce co-use by women.¹⁴

The study found that Black respondents were more likely to use flavored products, seemingly driven by more prevalent chasing, consistent with high menthol cigarette smoking among Black smokers.^{49,50} Latino/a/x respondents were more likely to use any flavored cannabis, flavored cannabis vapes, and chasing with flavored products, and users of other

minority racial/ethnic identity were also more likely to report menthol chasing. However, no association between racial/ethnic identity and flavored blunt use contrasts with reports that flavored cigars are more popular among cigar users of racial/ethnic minorities than White users.⁴⁰ In April 2021, the FDA announced plans to ban menthol cigarettes and menthol and flavored cigars, and local policies limiting flavored tobacco sales are increasing;⁵¹ this study suggests these actions might also decrease flavored cannabis use via reducing menthol cigarette use in co-use and chasing, among some racial/ethnic minority groups.

This study reported a significant association between cannabis use disorder symptoms and flavored cannabis use, consistent with a hypothesis that flavors contribute to dependence. While use of flavors is negatively associated with tobacco quit attempts,⁵² the impact of flavors on cannabis cessation is unknown. In combusted tobacco products, flavors can make consumption more palatable by masking tobacco taste, which might facilitate uptake by new users. Co-use of cannabis with flavored blunt wraps/cigars might have a similar utility. Investigation into how flavors impact cannabis perceptions and behavior across the array of cannabis products can further elucidate the impact of flavored cannabis on dependence and on cannabis and tobacco cessation.

Findings that tobacco use is significantly and positively associated with flavored cannabis use suggest that flavored product regulations in one market might spillover to affect the other market.

The measurement of inhaled flavored cannabis use in this study yields several considerations. First, flavored cannabis smoking/vaping is common and should be included in future cannabis research. Second, flavored cannabis use commonly occurs via co-use with flavored tobacco products; cannabis scholarship must consider co-use with flavored tobacco products.⁵³ This study describes a range of flavored cannabis consumption methods, including methods that are not marketed (e.g., mixing nicotine and cannabis liquids) and might have unique risk profiles. Future study should investigate product-specific impacts on use and dependence.

Documenting flavored use for cannabis extract vaporizers is less straightforward than for tobacco. Largely, flavored tobacco products have additive flavors (e.g., menthol, vanillin). In contrast, cannabis concentrates, wax, and oil are frequently named using flavor descriptors (e.g., Lemon Haze) that refer to strain and/or taste characteristics rather than to added flavorants. While the measures this study adapted are well-established for tobacco products,⁵⁴ there is an opportunity to further tailor measures for cannabis products. Methods to classify flavors in inhaled cannabis products in future studies For example, measures might include more flavor varieties (e.g., essential oils; flowers such as geranium and rose⁵⁵), consider other sensory effects (e.g., sour, earthy)³, and distinguish between flavor additives, strains with flavor “notes,” and references to flavor in name or packaging.

Findings suggest flavored cannabis use might exacerbate disparities by disproportionately appealing to younger adults, women, and cannabis users with a racial/ethnic minority identity. This risk is especially concerning given the associations of flavored cannabis use with cannabis use disorder symptoms and current tobacco use. Current efforts to end the sale

of flavored tobacco products⁵⁶ might have spillover effects on flavored cannabis use^{57,58} and disparities, although one study of cigarillos/blunts⁵⁹ suggests flavor appeal might be outweighed by other product characteristics.

Limitations

Findings are likely limited to the states with legalized cannabis for adult use, which have different cannabis market and culture than states without these laws. Flavored tobacco availability also varies geographically. Flavored cannabis use is worth further study across different policy contexts. Since data were collected, 12 additional states enacted measures to regulate cannabis for non-medical/adult use, and legal cannabis sales spiked in 2020 during the COVID-19 pandemic.⁶⁰ Continued surveillance is necessary to understand how changes in life circumstance, cannabis policy, and flavored tobacco regulation affect flavored cannabis perceptions and behaviors.

While analysis was calibrated using national estimates, results are not from a representative sample and should be interpreted with appropriate caution. In addition, it is likely that flavored cannabis extract vaporizer use was underestimated, given the absence of a “cannabis” flavor option. Measures asked about regular/usual use, and prevalence estimates are likely smaller than for any past 30-day use.⁶¹

CONCLUSIONS

This study found that flavored cannabis is used widely among adults in states with legalized cannabis adult use across a range of inhaled products. It is important to address disproportionate flavored cannabis use by young people, women, and people of color to promote health equity.

Integrated tobacco and cannabis flavor research, policy, and programs may identify points of synergy to address the health impact of both substances.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Unweighted respondent demographics, past 30-day cannabis users 21+ in states with legal cannabis for adult use (n=2,978).

Respondent characteristics	N	uw%	w%
Sex ^a			
Male	1,427	47.9%	60.4%
Female	1,533	51.5%	38.7%
Another	18	0.6%	0.9%
Age			
21 – 34	1,084	36.4%	48.7%
35 – 49	815	27.4%	23.2%
50 – 64	728	24.4%	19.8%
65+	351	11.8%	8.3%
Race/ethnicity			
White, not H/L ^b	2,111	70.9%	65.6%
Black, not H/L	151	5.1%	6.4%
Another race/ethnicity, not H/L	260	8.7%	10.8%
Hispanic/Latino/a/x	456	15.3%	17.2%
Education			
High school or less	571	19.2%	33.1%
Some college	1,230	41.3%	41.4%
Bachelor's degree or more	1,177	39.5%	25.5%
Past 30-day tobacco use			
No past 30-day use	1,345	45.2%	40.0%
Past 30-day use	1,633	54.8%	60.0%
Cannabis use disorder symptoms ^c			
No	2,255	75.7%	69.2%
Yes	723	24.3%	30.8%

^a Assessed with the item “Are you...” and response options male, female, and other with write-in

^b Not Hispanic/Latino/a/x

^c Measured based on CUDIT-R. Possible overall index scores range from 0–32. A score of 12 or more indicates cannabis use disorder symptoms.

Table 2.

Prevalence of past 30-day use and preferred flavor by product, past 30-day adult cannabis users

Respondent Characteristics	Past 30-day use (product users among all respondents) ^a		Any flavored use (flavored product users among past 30-day product users)	
	N	w%	N	w%
Cannabis				
Any cannabis	2,978	100.0%	1,218 ^b	46.5%
Extract vaporizers	1,298	47.2%	749	59.9%
Edibles	1,697	57.2%	-	-
Co-administration/sequencing				
Blunts	1,167	48.0%	774	63.4%
Co-use vaporizers	383	15.9%	302	77.3%
Chasing ^c	1,355	51.9%	984	74.7%
Tobacco				
Any tobacco	1,633	60.0%	1,073	68.8%
Cigarettes	1,317	49.0%	571	45.6%
Cigars	736	31.1%	436	58.5%
Smokeless tobacco	383	16.5%	257	67.3%
E-cigarettes	947	37.1%	731	76.4%
Hookah	520	22.1%	312	56.1%

^a Respondents could report using multiple products and column percentages will not add to 100.

^b Any flavored cannabis use defined as past 30-day use of flavored extract vaporizer, past 30-day use of flavored co-use vaporizer, or flavored regular brand of blunt. Does not include flavored chasing or use of edibles.

^c Following cannabis vaping or smoking with a cigarette, cigar, cigarillo, or e-cigarette.

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Table 3.

Most popular flavors by product, past 30-day adult cannabis users

Flavor	Extract vaporizers ^a (N = 1,298)		Blunts ^b (N = 1,167)		Co-use vaporizers ^a (N = 383)	
	N	w% ^c	N	w%	N	w%
Sweet	305	24.2%	114	10.8%	112	26.0%
Fruit	457	35.6%	327	27.4%	127	30.5%
Menthol/Mint	209	16.7%	169	12.7%	147	35.4%

^aFlavors of cannabis or tobacco product typically used in the vaporizer

^bFlavor of regular brand of cigar/blunt wrap

^cRespondents could report using multiple flavors, and less popular flavor options and nonflavored use are not reported; column percentages do not add to 100%.

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Table 4.

Predictors of flavored cannabis use (vs. non-flavored) by product, past 30-day adult cannabis users

Respondent Characteristics	Any cannabis ^a	Extract vaporizers	Blunts	Co-use vaporizers	Chasing ^b
	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]
Age					
21 – 34	REF	REF	REF	REF	REF
35 – 49	0.6 (0.5, 0.7)	0.8 (0.6, 1.1)	0.8 (0.6, 1.1)	1.3 (0.7, 2.3)	0.9 (0.7, 1.3)
50 – 64	0.3 (0.2, 0.3)	0.5 (0.4, 0.7)	0.8 (0.6,1.2)	0.5 (0.2,1.0)	0.6 (0.4, 0.9)
65+	0.1 (0.1, 0.2)	0.4 (0.2, 0.6)	0.9 (0.3, 2.2)	0.5 (0.1, 3.1)	0.8 (0.4, 1.4)
Sex					
Male	REF	REF	REF	REF	REF
Female	1.2 (1.0, 1.4)	1.2 (0.9, 1.5)	1.9 (1.4, 2.4)	1.8 (1.0, 3.0)	0.8 (0.6, 1.0)
Race/ethnicity					
White, not H/L	REF	REF	REF	REF	REF
Black, not H/L	2.2 (1.5, 3.1)	1.7 (1.0, 2.8)	1.1 (0.7, 1.7)	1.8 (0.5, 7.0)	1.9 (1.1, 3.4)
Another race/ethnicity, not H/L	1.2 (0.9, 1.6)	1.5 (1.0, 2.3)	0.9 (0.6, 1.4)	1.2 (0.5, 2.8)	2.2 (1.3, 3.6)
Hispanic/Latino/a/x	1.6 (1.2, 1.9)	1.4 (1.1, 2.0)	0.7 (0.5, 1.0)	1.0 (0.6, 1.7)	1.9 (1.3, 2.7)
Education					
High school or less	REF	REF	REF	REF	REF
Some college	0.9 (0.7, 1.2)	1.0 (0.8, 1.4)	0.9 (0.7, 1.3)	1.0 (0.5, 2.0)	0.9 (0.6, 1.2)
Bachelor's degree or more	0.9 (0.7, 1.1)	1.3 (0.9, 1.8)	0.8 (0.6, 1.2)	1.1 (0.6, 2.3)	1.6 (1.1, 2.4)
Cannabis use disorder (CUD) symptoms					
No CUD	REF	REF	REF	REF	REF
CUD	2.0 (1.6, 2.4)	1.2 (0.9, 1.5)	1.2 (0.9, 1.5)	1.8 (1.1, 3.1)	2.0 (1.5, 2.6)
Past 30-day tobacco use					
No past 30-day use	REF	REF	REF	REF	REF
Past 30-day use	2.4 (2.1, 2.9)	1.5 (1.2, 1.9)	0.6 (0.4, 0.8)	0.4 (0.1, 1.6)	4.5 (2.9, 7.2)
N	2,960	1,288	1,160	380	1,348

Boldface indicates statistical significance (p<0.05)

^aFor all users and for each product, weighted multivariate logistic regression compared flavored use and non-flavored use among past 30-day product users.^bFollowing cannabis vaping or smoking with a cigarette, cigar, cigarillo, or e-cigarette; flavored chasing was identified for respondents who chased vaping or smoking cannabis with a mentholflavored cigarette, cigar, cigarillo, or e-cigarette some of the time or every time they chased cannabis with nicotine.