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Popular flavors used in alternative tobacco products among young adults

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Abstract

Purpose: To examine flavors of alternative tobacco products most commonly used by young adults (YA).

Methods: California YA (N=365; mean age=20.0) were surveyed in 2018 about the first and usual flavors of alternative tobacco products used. Flavor categories were fruit, candy, menthol, mint, coffee, spice, alcohol, wintergreen, and tobacco.

Results: Fruit and mint were the most common flavors used [pod-based e-cigarettes: 35.4% and 29.3%; other e-cigarettes: 52.7% and 23.1%; hookah: 45.4% and 18.5%; cigars/cigarillos: 22.4% and 6.9%, respectively]. For other e-cigarettes and hookah, candy was also popular [20.5%, and 14.8%, respectively]. For pod-based and other e-cigarettes, menthol was widely used [13.4% and 17.0%, respectively]. Approximately half of ever-flavor users reported they “usually” used the same flavors across products [menthol users: 52.2%; fruit users: 51.7%; mint users: 44.0%; and candy users: 43.8%].

Conclusions: YA are clearly using flavors, specifically fruit, mint, candy, and menthol, in their tobacco products.

Keywords

young adults; e-cigarettes; electronic cigarettes; flavors; tobacco

The tobacco industry uses flavors in alternative tobacco products (e.g., e-cigarettes, hookah, cigars/cigarillos) to attract young and new users, with over 7,700 flavors available in e-cigarettes alone.^{1,2} Adolescents and young adults (YA) have stronger preferences for

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Conflicts of Interest

The authors have no conflicts of interest to disclose.

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flavored tobacco compared to older adults,³ with 70-80% of young tobacco users using flavors.³

The US Food and Drug Administration (FDA) and state and local agencies are seeking evidence to inform tobacco flavor regulation.⁴ However, research has predominately focused on flavors more generally or on non-menthol flavorings, rather than examining specific flavors.^{3,5} Additionally, few have studied flavors used with hookah and cigars/cigarillos.^{3,5} To inform regulatory actions, we examined the array of flavors used by YA (aged 18-26) in pod-based e-cigarettes, other e-cigarettes, hookah, and cigars/cigarillos.

METHODS

Design and participants

An online survey administered by Qualtrics (Provo, UT) was completed by 365 racially/ethnically diverse California YA (mean age=20.0; 64.9% female; 83.6% currently in college; see Supplemental Table for detailed demographics) participating in Wave 7 of a longitudinal study of tobacco use and perceptions. More details on the original sample were described elsewhere.² The survey was completed from August-October 2018. Consent forms were obtained from participants. The study was approved by Stanford University's Institutional Review Board.

Measures

Respondents answered questions about ever and past 30-day use of pod-based e-cigarettes, other e-cigarettes, hookah, and cigars/cigarillos. For each product ever used, participants indicated whether the first product they used was flavored. If yes, they were asked which flavor (fruit, candy, menthol, mint, tobacco, coffee, alcohol, spice, wintergreen, unflavored, other, and unsure/unknown) was first used and usually used for each tobacco product.

Analysis

Unweighted frequencies and proportions were calculated for each flavor and tobacco product. Number of products (from 0-4) usually used for each flavor by participant was computed. Analyses were conducted using STATA 15.

RESULTS

The majority of ever-tobacco users reported using flavors the first time they tried a tobacco product (pod-based e-cigarettes: 72.0%; other e-cigarettes: 84.8%; hookah: 79.6%; cigars/cigarillos: 32.8%). The most common first-flavors were fruit, mint, and candy. Fruit and mint were the most common flavors usually used (pod-based e-cigarettes: 35.4%, 29.3%; other e-cigarettes: 52.7%, 23.1%; hookah: 45.4%, 18.5%; cigars/cigarillos: 22.4%, 6.9%, respectively). Other popular flavors were menthol for pod-based e-cigarettes (13.4%) and other e-cigarettes (17.0%), candy for other e-cigarettes (20.5%) and hookah (14.8%), and spice for cigars/cigarillos (5.2%). Notably, 24.1-56.9% of participants were unaware of which flavors they used, and virtually none of the participants used tobacco flavored products (Table 1). Approximately half of ever-flavor users reported usually using the same

flavors across products: menthol (52.2%), fruit (51.7%), candy (43.8%), and mint (44.0%) (Table 2).

DISCUSSION

This study extends the literature by examining a wide range of flavors used across alternative tobacco products among YA, with separate categories for mint and menthol and for pod-based e-cigarettes and other e-cigarettes. We found both sweet (fruit and candy) and non-sweet (menthol and mint) flavors were most commonly used, and tobacco flavored products were not used among YA. Furthermore, half of the flavor-users reported usually using the same flavors across multiple products, and many were unsure of flavors used.

We confirmed widespread appeal of flavored alternative tobacco products among YA, showing fruit, candy, mint, and menthol were particularly appealing regardless of products.^{3,5} Industry-targeted marketing,² coupled with flavor preferences inherent among YA,⁶ contribute to the popularity of sweet-flavored tobacco. We found YA preferred sweet flavors for both experimentation and usual use.

In our sample, substantial proportions of YA lacked awareness of the flavors used and marked “unknown/unsure” on the survey. It could be that names of flavors (e.g., unicorn, sugar booger) are so nuanced that YA do not know which flavor category to answer. Another explanation may be that participants are sharing e-cigarettes and are unaware of what they are using. More research on measuring flavored tobacco use is warranted.

Currently, several states and cities are considering eliminating the sale of flavored tobacco; however, several bills have exemptions for mint/menthol, arguing that these flavors are not for youth.^{4,7} The Tobacco Control Act did not consider menthol as a “flavor,”⁴ possibly impacting efforts to ban menthol. Our finding that mint and menthol are among the most commonly used flavors suggests appeal to YA similarly as do other characterizing flavors, and similarly as has been found for adolescents.⁶ Moreover, mint and menthol may increase tobacco use disparities since tobacco companies have used these flavors to target vulnerable populations (e.g., youth, females, and African Americans).⁹ Emerging evidence suggests that flavors might further contribute to poly-tobacco use and subsequent nicotine addiction.³ Although our study was not powered to examine this hypothesis, the majority of ever-users did report using the same flavors across products. Additionally, there is inconsistent and inadequate evidence suggesting flavors help adult smokers quit.³ Collectively, the evidence points to needed regulation of all flavored tobacco products, including mint and menthol.

Since our original sample was a school-based convenience sample, the findings may not be representative of the California YA population. Additionally, two thirds of our sample were female; however, we did not find gender differences on flavor use in subgroup analysis (data not shown). Also, the findings may not generalize to other states that have higher smoking rates and fewer tobacco control policies than California (e.g., high taxes, older minimum age of tobacco purchase). Additionally, self-reported data and a large proportion of “unknown” responses may threaten the validity of our results.

Our findings provide the most updated data on flavor preferences across alternative tobacco products, suggesting that all flavors, including mint and menthol, should be eliminated from all tobacco products. By eliminating the sale of all flavored tobacco, these products will be less appealing to youth and YA, and they will be more likely to quit using tobacco.¹⁰ As such, their tobacco use and associated negative health effects are likely to decrease. As the US, several states, and cities are proposing a comprehensive ban on all flavored tobacco products, this study makes a timely contribution by providing the rationale for this important regulation.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Abbreviations

YA young adults

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IMPLICATIONS AND CONTRIBUTIONS

The FDA, several states, and cities are proposing bills to eliminate the sale of all flavored tobacco products. More research is needed to inform these bills. This study shows the most common flavors (i.e., fruit, mint, candy, and menthol) used across e-cigarettes, hookah, and cigars/cigarillos among young adults.

Table 1:

Flavors usually used by tobacco products among 365 California young adults in 2018^a

| | Pod-based e-cigarettes N (%) | Other e-cigarettes N (%) | Hookah N (%) | Cigars/Cigarillos N (%) |
|---|---------------------------------|-----------------------------|-----------------|----------------------------|
| Ever users | 82 (22.5) | 112 (30.7) | 108 (29.6) | 58 (15.9) |
| Current users | 41 (11.2) | 28 (7.7) | 0 (0.0) | 11 (3.0) |
| Used flavor at the first time use of the product | 59 (72.0) | 95 (84.8) | 86 (79.6) | 19 (32.8) |
| First flavor used | | | | |
| Fruit | 21 (25.6) | 42 (37.5) | 42 (38.9) | 9 (15.5) |
| Mint | 23 (28.1) | 7 (6.3) | 8 (7.4) | 2 (3.5) |
| Candy | 6 (7.3) | 18 (16.1) | 3 (2.8) | 2 (3.5) |
| Menthol | 2 (2.4) | 5 (4.5) | 1 (0.9) | 0 (0.0) |
| Tobacco flavored | 0 (0.0) | 0 (0.0) | 0 (0.0) | 1 (1.7) |
| Wintergreen | 1 (1.2) | 1 (0.9) | 2 (1.9) | 0 (0.0) |
| Coffee | 0 (0.0) | 1 (0.9) | 0 (0.0) | 0 (0.0) |
| Spice | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Alcohol | 1 (1.2) | 0 (0.0) | 1 (0.9) | 0 (0.0) |
| Other | 2 (2.4) | 3 (2.7) | 3 (2.8) | 0 (0.0) |
| Unknown/Unsure | 23 (28.1) | 18 (16.1) | 26 (24.1) | 5 (8.5) |
| Unflavored | 3 (3.7) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Flavor usually used | | | | |
| Fruit | 29 (35.4) | 59 (52.7) | 49 (45.4) | 13 (22.4) |
| Mint | 24 (29.3) | 26 (23.1) | 20 (18.5) | 4 (6.9) |
| Candy | 7 (8.5) | 23 (20.5) | 16 (14.8) | 2 (3.5) |
| Menthol | 11 (13.4) | 19 (17.0) | 4 (3.7) | 2 (3.5) |
| Tobacco flavored | NA | 2 (1.8) | NA | NA |
| Wintergreen | 4 (4.9) | 5 (4.5) | 8 (7.4) | 1 (1.7) |
| Coffee | 2 (2.4) | 1 (0.9) | 1 (0.9) | 1 (1.7) |
| Spice | 0 (0.0) | 1 (0.9) | 1 (0.9) | 3 (5.2) |
| Alcohol | 1 (1.2) | 1 (0.9) | 3 (2.8) | 0 (0.0) |
| Other | 7 (8.5) | 8 (7.1) | 6 (5.6) | 2 (3.5) |
| Unknown/Unsure | 26 (31.7) | 27 (24.1) | 37 (34.3) | 33 (56.9) |
| Unflavored | 3 (3.7) | 4 (3.6) | 5 (4.6) | 7 (12.1) |

Mean (SD) age, 20.0 (1.5) years.

Table 2:

Usual flavor used in multiple tobacco products among 365 California young adults in 2018^a

| Flavor | Ever-flavor users N (%) | In a single product N (%) | In multiple products N (%) |
|-------------|----------------------------|------------------------------|-------------------------------|
| Fruit | 89 (100.0) | 43 (48.3) | 46 (51.7) |
| Mint | 50 (100.0) | 28 (56.0) | 22 (44.0) |
| Candy | 32 (100.0) | 18 (56.2) | 14 (43.8) |
| Menthol | 23 (100.0) | 11 (47.8) | 12 (52.2) |
| Wintergreen | 13 (100.0) | 9 (69.2) | 4 (30.8) |
| Coffee | 3 (100.0) | 2 (66.7) | 1 (33.3) |
| Spice | 5 (100.0) | 5 (100.0) | 0 (0.0) |
| Alcohol | 3 (100.0) | 2 (66.7) | 1 (33.3) |

^aMean (SD) age, 20.0 (1.5) years.

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