Mint, menthol, sweet, and tobacco ENDS liquid flavorings in relation to nicotine formulation and concentration: results from the population-based VAPER study

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Background

Sweet and menthol flavors may reduce the harshness of the nicotine present in electronic nicotine delivery systems (ENDS). These flavors may improve the appeal/palatability of ENDS, which could increase self-administration and nicotine exposure. Certain populations (e.g., young adults) report lower harm perceptions for ENDS with non-tobacco flavors. The present study explores the relationship between liquid flavor and nicotine concentration and formulation.

Methods

- Participants were recruited from 125 US cities using social media and Craigslist from May-October 2020.
- 1209 adult (21+) regular e-cig users (5+ days of use/week) completed an online survey and submitted photos of their most used e-cig device/liquid.
- Liquid flavors were grouped into four categories based on the primary flavor.
- When data were available (n=1058), Kruskal-Wallis tests were used to test for significant differences in nicotine concentration (mg/mL) across flavors, stratified by formulation.

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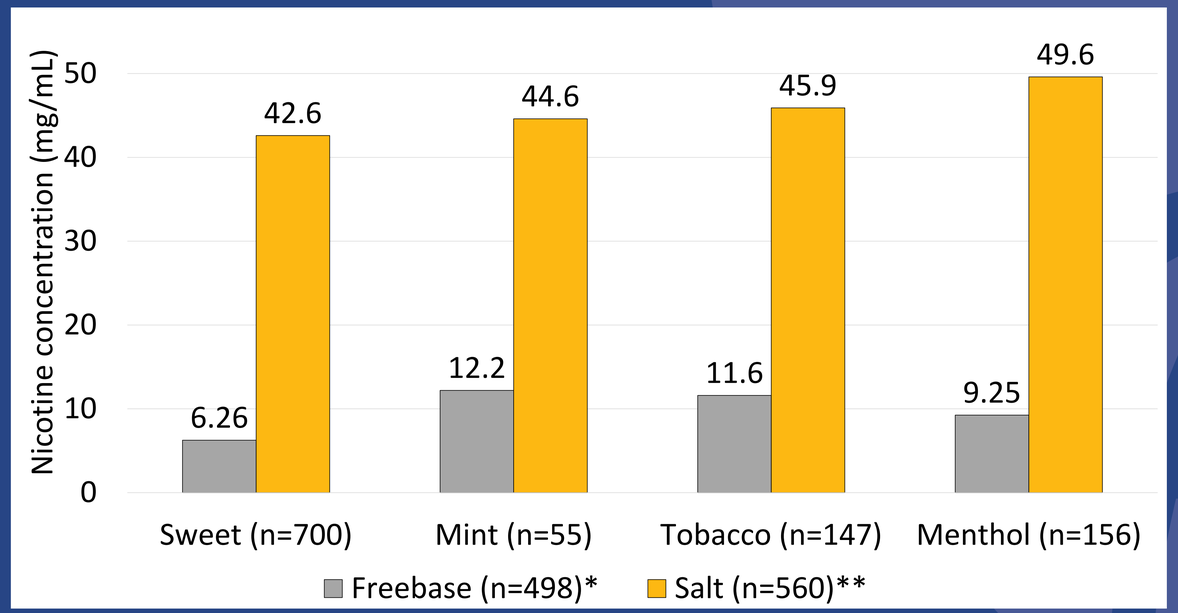
VCU

Nicotine concentration used varies by flavor type and formulation among regular ENDS users.



*H(3) = 14.1; p = 0.0027; **H(3) = 54.1; p = 0.0001

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Results

- Sweet flavors were most common (n=700), followed by menthol (n=156), tobacco (n=147), and mint (n=55).
- Among freebase liquids, mean nicotine concentration was highest for mint and tobacco, followed by menthol and sweet (H(3)=14.1; p=0.0027).
- Among nicotine salt liquids, mean nicotine concentration was highest for menthol, followed by tobacco, mint, and sweet (H(3)=54.1; p=0.0001).

Discussion

- Menthol flavors were used with the highest nicotine concentrations among users of nicotine salt liquids; participants may be using menthol flavoring to mask the harshness of high nicotine concentrations.
- Future research may examine these relationships using longitudinal data (e.g., changes in concentrations over time by flavor) or stratified by use characteristics (e.g., smoking status, vaping frequency, length of time vaping, demographics, device type/wattage).

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