

This space will be automatically filled with a QR code and number for easy sharing



Institute for Global Tobacco Control



E-cigarette device wattage and liquid nicotine concentration vary by device type and have a weak to moderate inverse relationship

Inverse correlation of e-cigarette device power and liquid nicotine concentration: are users self-regulating nicotine emissions?

Presenter: Joshua Sinamo, BS

Background

E-cigarette power (Watts, W) and liquid nicotine concentration (mg/mL) are important predictors of nicotine emissions and delivery. We examined the relationship between device wattage and liquid nicotine concentration among regular e-cigarette users to determine the extent that these two factors interact in practice.

Methods

- 1209 U.S. adults (21+) using e-cigarettes 5+ days/week were asked about, and submitted photos of, their most used device/liquid from the past week.
- Information from photos, online, research, and survey responses were used to construct a comprehensive database of device and liquid characteristics.
- Pearson correlation analyses were conducted on a total of 808 participants who provided complete information on nicotine concentration, device power and device type.

Results

- Median wattage tended to be higher for refillable devices.
- Median nicotine concentration tended to be higher for disposable devices and devices with disposable pods/cartridges.

| Device Type | n | Median (Min, Max) Wattage | Median (Min, Max) Nicotine Concentration | Correlation Coefficient between Wattage & Nicotine Concentration* | p* |
|---------------------|------------|---------------------------|--|---|------------------|
| Refillable Tank | 437 | 60 (6, 220) | 6 (0, 90) | -0.22 | <0.001 |
| Refillable Pod/Cart | 195 | 15 (3, 80) | 25 (0, 90) | -0.23 | <0.001 |
| Disposable Pod/Cart | 173 | 10 (6, 30) | 50 (0, 80) | -0.07 | =0.368 |
| Disposable | 3 | 10 (10, 10) | 50 (2, 60) | 0 | =1.000 |
| All Devices | 808 | 29 (3, 220) | 18 (0, 90) | -0.57 | <0.001 |

*Pearson's correlation coefficients are presented; p<0.05 significance noted in green
 Note: Nicotine concentration is displayed in mg/mL and reported based on labels from photos of liquid or self-reported data

www.jhsph.edu/igtc | www.cstp.vcu.edu

Acknowledgements: Research reported in this publication was supported by NIDA and FDA Center for Tobacco Products (CTP) under Award Number U54DA036105. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH or the Food and Drug Administration.

Competing Interests: Dr. Eissenberg is a paid consultant in litigation against the tobacco industry and also the electronic cigarette industry. Dr. Eissenberg is named on one patent for a device that measures the puffing behavior of electronic cigarette users. Dr. Eissenberg and Dr. Soule are on a patent for a smartphone app that determines electronic cigarette device and liquid characteristics

Results (cont.)

- Overall, the correlation between wattage and nicotine concentration was negative and significant.
- By device type, the correlations were weaker, but still significant for devices with refillable tanks and refillable pods/cartridges.
- Information regarding disposable device's power was rarely listed on the internet.

Discussion

While it is possible to consume high nicotine concentrations from high powered devices, findings suggest that participants tend to use lower nicotine concentrations with higher powered devices and vice versa.

Authors

Kevin Welding¹, PhD; Jeffrey J Hardesty¹, MPH; Joanna E Cohen¹, PhD; Elizabeth Crespi¹, BA; Joshua Sinamo¹, BS; Qinghua Nian¹, PhD; Ryan David Kennedy¹, PhD; Alison Breland², PhD; Eric K Soule, PhD³; Thomas Eissenberg², PhD

1. Institute for Global Tobacco Control, Johns Hopkins Bloomberg School of Public Health
2. Center for the Study of Tobacco Products, Virginia Commonwealth University
3. Department of Health Education and Behavior, East Carolina University