

# Understanding Adverse Events With Vaping Among Young Adults

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## Abstract

Previous studies suggest that adverse events (AEs) are common among adult e-cigarette users. In online focus groups conducted with 114 current and former young adult e-cigarette users in California, over 40 unique adverse symptoms were reported. Just over 40% of AEs lasted less than one hour and over 80% lasted less than one day. In response to AEs, approximately equal proportions of respondents either did nothing, quit permanently, cut back temporarily, or switched to another tobacco or cannabis product. These findings suggest that greater post-market surveillance of e-cigarette and other nicotine products whose safety profiles are not well understood is needed.

## Introduction

Among e-cigarette users, numerous adverse symptoms are reported by a significant proportion of users.<sup>1</sup> In the first national sample of U.S. adults examining adverse symptoms of e-cigarette use, over half of all ever users attributed one or more symptoms to e-cigarette use. Cough (40%), dry or irritated mouth or throat (31%), and dizziness or lightheadedness (27.1%) were the most commonly reported symptoms. According to the FDA, over half of their tobacco-related adverse event (AE) reports have been for electronic cigarettes and include serious AEs. It has been hypothesized that an increase in these AEs may be associated with aggressive marketing and increased access to unregulated e-cigarette products, particularly flavor pods and online vendors.<sup>2,3</sup> Youth and young adults are particularly vulnerable to e-cigarette AEs due to their high use.

## Objective

The purpose of this study was to characterize young adult experiences with e-cigarette AEs, specifically the duration and behavioral responses to various AEs experienced by young adults.

## Materials and methods

In April 2021, 16 online focus group were conducted with 114 young adults in California. Study inclusion criteria were: (1) age 18-29 years, (2) used an electronic nicotine delivery system (ENDS) in the past three years, and (3) resident of California. Participants were assigned to one of 16 focus group stratified on 3 criteria: (1) having ever experienced an ENDS-attributed AE, (2) current (past 30 days) or former ENDS user, and (3) ENDS use pattern (ENDS only; ENDS and cigarette dual use; ENDS and alternative tobacco product dual use; and ENDS and cannabis product dual use, including cannabis flower or THC vapes). Discussion topics included current and previous tobacco and cannabis use; experiences with ENDS-attributed AEs; EVALI; COVID-19 and ENDS and other product use. The study protocol was approved by the Institutional Review Board at California State University, Fullerton (HSR 19-20-565).

Focus group recordings were transcribed, reviewed for accuracy, and uploaded into ATLAS.ti 9 for analysis. The codebook for the analysis was developed using a team-based approach with research assistants coding the same transcript until intercoder agreement reached Krippendorff's  $\alpha = 0.883$  on the first coding attempt. After coding and subcoding the data, analysis of focus group texts resulted in subcodes grouped into themes within each code.

## Over 40 unique adverse symptoms

No. of mentions	Adverse symptom
35	Headache
25	Dry/sore throat/mouth
22	Lightheadedness
22	Nausea
22	Coughing
17	Dizziness
13	Difficulty breathing
12	Chest pain/tightness/heaviness
9	Throat pain
8	Head rush
7	Phlegm

## Just over 40% lasted less than one hour, over 80% less than one day

Adverse symptom	Duration
Headache	12 hours or less
Dry/sore throat/mouth	Few hours to few days
Lightheadedness	Less than 3 hours
Nausea	Less than 3 hours
Coughing	Less than 1 hour
Dizziness	Less than 3 hours
Difficulty breathing	Less than 1 hour
Chest pain/tightness/heaviness	Less than 1 hour
Throat pain	More than one day

## Roughly equal proportions did nothing, quit permanently, cut back temporarily, or switched to another product in response to adverse symptoms

Behavioral response	Adverse symptoms
Quit permanently	Difficulty breathing Chest pain/tightness/heaviness
Temporarily cut back	Headache Dry/sore throat or mouth Coughing
Switch to other tobacco or THC product	Lightheadedness Dizziness Throat pain

## Conclusion

- There are many e-cigarette-attributed AEs experienced by young adults.
- Adverse symptoms vary in duration and behavioral response.
  - + Many e-cigarette-attributed adverse events resolve in less than an hour, and most in less than one day.
  - + Difficulty breathing and chest pain or tightness are more commonly associated with quitting e-cigarettes permanently.
- Switching to cannabis or other tobacco products (e.g., cigarettes) may suggest a broader experimentation of tobacco and cannabis with AEs playing a role in shaping product use.

## Discussion

Though the results of this study are not generalizable to the overall young adult population, they suggest that greater regulatory action is needed for post-market surveillance of e-cigarettes and other novel nicotine products whose short- and long-term safety profiles are not well understood.

## References

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- No off-label medication is discussed in this presentation.