

Tweets show vapers rarely use e-cigarettes to quit smoking or improve health

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The vast majority of Twitter users who vape with JUUL e-cigarettes are not using the devices to stop smoking or to improve their health, according to a research team led by University of Utah Health scientists.

The researchers say this finding, which challenges JUUL's stated mission of improving smokers' lives, could help hone anti-smoking and vaping efforts targeted at Twitter users, particularly underage teens.

Based on their manual analysis of more than 4,000 tweets, the scientists concluded that only 1% of Twitter users mentioned JUUL as a smoking cessation method and scarcely 7% referred to any potential health benefits of using the [vaping devices](#).

The study, which was conducted in conjunction with the University of Washington School of Medicine and the University of California, San Diego, appears in the *Journal of Medical Internet Research—Public Health & Surveillance*.

"Some people thought that my generation was going to end smoking," says Ryzen Benson, lead author of the study and a graduate student in the U of U Health Department of Biomedical Informatics. "For a while, we did see a large decline in smoking among teens and younger adults. But then JUUL and other electronic nicotine delivery systems became popular."

"This emergence is reflected in what we found being posted on Twitter," Benson says. "Based on what we saw in people's tweets, they are clearly not using JUUL as a smoking cessation tool or as a healthier alternative to traditional cigarettes."

Use of e-cigarettes—devices that heat liquid to produce a vapor that users inhale into their lungs—has skyrocketed since they were first introduced in 2007. Between 2017 and 2019, the percentage of high school students who vape rose almost 2.5 times, from 11.7% to 27.5%, according to the Centers for Disease Control. In 2020, that percentage has dipped to about 20%, perhaps due in part to vaping being linked to more than 2,500 hospitalizations nationwide—and 55 deaths, including

one in Utah—before the end of 2019.

Previous studies have suggested that [social media](#), including Twitter, could be driving the popularity of e-cigarette usage as well as providing a forum for misinformation about the risks of using these devices.

Intrigued, the researchers involved in the current study sought to find out what Twitter users, particularly teens, are posting about JUUL, the most popular e-cigarette brand, which accounts for 76% of the vaping market.

Using vaping-related keywords such as "JUUL," "vaping pod," and "pod mod," the researchers accessed a free Twitter application that allowed them to collect 29,590 relevant tweets posted nationwide from July 2018 to August 2019. After eliminating duplicates, they used both manual and computational machine learning techniques to analyze the remaining 11,556 unique English language tweets.

Of the 4,000 tweets that were manually analyzed, the researchers found that 3,152 (79%) specifically mentioned JUUL or JUUL-related products and accessories. Of these, 1,792 (57%) referred to first-person usage such as, "I left my JUUL at the party last night." Overall sentiment was more positive ("I love JUUL") than negative ("I will never touch JUUL again!"). Only 45 tweets (1%) mentioned JUUL as a means of smoking cessation; 216 (7%) referred to possible health benefits or concerns.

"I was expecting that few tweets would mention smoking cessation but wasn't expecting only 1%", says Mike Conway, Ph.D., senior author of the study and assistant professor of biomedical informatics at U of U Health. "I was also expecting there to be more discussion of health-related issues, which turned out to be largely absent from our dataset."

The researchers manually identified more than 200 tweets that likely were from underage users ("For my 16th birthday, I want mango JUUL

pods"). They then used machine-learning algorithms to see if computers could identify these underage tweets faster and more accurately among 7,356 tweets that were not manually analyzed. They did.

"By developing machine-learning algorithms, we can identify underage tweets with 99% accuracy in just minutes or even seconds," Benson says

The study only analyzed a small number of the total available tweets stored on Twitter. The keyword list was not exhaustive and didn't include all e-cigarette devices used in the United States. The researchers also note that Twitter users may not be representative of the general U.S. population.

Moving forward, the researchers hope this information can be used to generate tailored [health messages](#). The messages, based on keywords that appear in social media exchanges, could be automatically delivered to JUUL users who use Twitter and other sites, Conway says.

More information: Ryzen Benson et al, Investigating the Attitudes of Adolescents and Young Adults Towards JUUL: Computational Study Using Twitter Data, *JMIR Public Health and Surveillance* (2020). [DOI: 10.2196/19975](#)

Provided by University of Utah Health Sciences

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