



Short communication

Self-reported reasons for vaping among 8th, 10th, and 12th graders in the US: Nationally-representative results



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ABSTRACT

Objective: The study describes the most common reasons for using vaporizers (such as e-cigarettes) among US adolescents and investigates how reasons for use differ by grade, lifetime cigarette use, frequency of vaporizer use, gender, race/ethnicity, and parent education.

Method: Data were collected from 4066 students in the 8th, 10th, and 12th grades in 2015 as part of the Monitoring the Future study, a cross-sectional and nationally representative US survey.

Results: Common reasons for vaporizer use reported by respondents who had ever used a vaporizer were experimentation (53.0%), taste (37.2%), boredom (23.5%), having a good time (22.4%), and relaxation (21.6%). Reasons differed little across grades or parent education; reasons differed by lifetime use of regular cigarettes, frequency of vaping, gender, and race/ethnicity.

Conclusions: Overall, results suggest that decisions to vape are based on curiosity, taste, and pleasure, rather than for reasons such as quitting regular cigarettes or substituting for regular cigarette smoking.

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1. Introduction

Adolescent use of electronic vaporizers to inhale nicotine and other aerosols is increasing at an alarming rate. From 2011 to 2014, the use of “electronic cigarettes or e-cigarettes”—a specific type of vaporizer—increased nine-fold among US high school students and six-fold among middle school students (Arrazola et al., 2015; Centers for Disease Control and Prevention (CDC), 2015). Among national samples of 8th and 10th graders, at least twice as many students reported using electronic vaporizers (such as e-cigarettes), compared to regular cigarettes (Miech et al., 2015a). The current study reports nationally representative data on adolescent reasons for vaping and differences across sociodemographic and tobacco-use subgroups.

Vaporizers deliver an inhalable aerosol that can contain flavors and/or nicotine, in addition to other chemicals (e.g., Behar et al., 2014; Goniewicz et al., 2014). This study intentionally uses the general term “vaporizers,” which casts a wide net including “e-cigarettes” and other newly available vaping devices. Over 450 e-cigarette brands and 7700 flavors exist today, marketed to youth

much as cigarettes were before regulations (CDC, 2015; Zhu et al., 2014), with advertising dollars for vaping increasing almost 20-fold from 2011 to 2014 (CDC, 2016). Packaging labels and device settings do not precisely indicate the ingredients delivered, and “nicotine-free” e-liquids have been found to contain nicotine (Cameron et al., 2014; Goniewicz et al., 2014; Walton et al., 2014).

The rising use of vaporizers is of public health concern because of its potential negative impact on adolescent health. Use of nicotine in vaporizers can harm the developing adolescent brain (Breland et al., 2016), particularly affecting attention and learning. Nicotine also has a high potential for addiction (England et al., 2015; Kandel and Kandel, 2015). Recent studies show that adolescent use of e-cigarettes is associated with intention to use and actual use of regular cigarettes (Bunnell et al., 2015; Dutra and Glantz, 2014; Leventhal et al., 2015) and with progression to regular cigarette smoking (Primack et al., 2015), although additional research is needed. If vaporizer use leads to use of regular cigarettes then vaporizers may reverse the decades-long decline in adolescent smoking prevalence and its associated benefits for population health.

The potential public health impact of vaporizers has generated substantial interest in the reasons that adolescents self-report for using them. Knowing why adolescents use vaporizers is a first step toward identifying strategic approaches and policies to effectively

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counter and ideally reverse the rise in youth vaporizer use (e.g., Carroll Chapman and Wu, 2014; Kong et al., 2015; Lippert, 2015). In initial findings, quitting smoking does not appear to be a primary reason for vaporizer use among youth. Curiosity, flavors, and peer influences were identified as top reasons for e-cigarette use in seven middle schools, high schools, and colleges in Connecticut (Kong et al., 2015). Enjoyment was the primary reason for using e-cigarettes among undergraduates at four colleges in New York State (Saddleson et al., 2016). In a national study of teen flavored tobacco use, the primary reason for e-cigarette use was flavoring, followed closely by doing less harm than with cigarettes (Ambrose et al., 2015). These studies suggest that reasons for vaporizer use among youth differ substantially and warrant separate study from the reasons given by adults, who are more likely to report use of vaporizers in an attempt to quit smoking and improve personal health (e.g., Berg et al., 2014; Pepper et al., 2014; Soule et al., 2016).

The current study reports nationally representative data on adolescent reasons for vaping. Research aims were to examine: (1) the most common reasons for vaporizer use among US adolescents in 8th, 10th, and 12th grades; and (2) how reasons for use differ by grade, lifetime use of regular cigarettes, frequency of vaporizer use, gender, race/ethnicity, and parent education. Based on research to date, we expect reasons other than quitting smoking to predominate. National data on the reasons why adolescents use vaporizers will inform national policy on vaporizer use, and help build a cumulative scientific literature on the topic.

2. Methods

2.1. Sample

The Monitoring the Future (MTF) project conducts annual cross-sectional surveys of 8th, 10th, and 12th graders in the contiguous US (Miech et al., 2015b), administered to each grade in separate schools that participate for two consecutive years. The 2015 samples total 44,892 students in 382 public and private schools (Johnston et al., 2016). Students are randomly assigned to different questionnaires to increase coverage of MTF topics and reduce respondent burden; accordingly, one third of 8th and 10th graders and one sixth of 12th graders received questions about vaporizer use. Participants who indicated ever having used a vaporizer were asked about reasons for use. The weighted sample sizes of lifetime vaporizer users were 962 in 8th grade, 1654 in 10th grade, and 1449 in 12th grade. MTF is approved by the University of Michigan Institutional Review Board.

2.2. Measures

Reasons for use were assessed with the survey question, “What have been the most important reasons for your using an electronic vaporizer such as an e-cigarette? (Mark all that apply.)” The reasons were ‘to help me quit regular cigarettes,’ ‘because regular cigarette use is not permitted,’ ‘to experiment—to see what it’s like,’ ‘to relax or relieve tension,’ ‘to feel good or get high,’ ‘because it looks cool,’ ‘to have a good time with my friends,’ ‘because of boredom, nothing else to do,’ ‘because it tastes good,’ and ‘because I am ‘hooked’—I have to have it.’

Covariates included grade in school (8th, 10th, 12th), lifetime use of regular cigarettes (yes, no), frequency of vaporizer use in the last 30 days (1–2, ≥ 3 days), gender (male, female), race/ethnicity (White, Black, Hispanic, Other), and parent education (parent[s] graduated from college; yes, no).

2.3. Analyses

Data were analyzed using PROC SURVEYREG in SAS version 9.4 (2012). LSMEANS with the *diffs* option calculated and compared

differences between subgroups. All analyses used sampling weights to adjust for the complex sample design.

3. Results

The percentage of ever-users of vaporizers who reports the various reasons for vaporizer use is provided in Table 1. The most common reason for use was to experiment (53.0%), followed by taste (37.2%), boredom (23.5%), to have a good time (22.4%), and to relax (21.6%). Less common reasons were because it looks cool (13.7%) and to feel good or get high (8.3%). Reasons pertaining to regular cigarette use, including to quit regular cigarettes (7.3%) and because regular cigarette use is not permitted (6.1%), were not common. The least common reason reported for vaping was being hooked (1.1%).

Differences in reasons for vaporizer use by grade, lifetime use of regular cigarettes, and frequency of vaping are shown in Table 1. There were few differences by grade, although younger students were less likely to report taste (8th < 10th and 12th graders) and to quit regular cigarettes (8th < 10th < 12th graders) as reasons for vaping. Students who had ever used regular cigarettes were significantly more likely than never smokers to report all reasons, except to experiment (more common among never-smokers) and to have a good time with friends or to look cool (no significant differences). Although “to quit regular cigarettes” and “because regular cigarette use is not permitted” were reported more frequently among regular cigarette users than non-users, these cigarette-related reasons were still among the least common reasons to vape even for smokers. Teens who reported frequent past-month vaping were significantly more likely than infrequent vapers to report 6 out of 10 reasons; infrequent vapers were more likely to report experimenting.

Differences in reasons for vaporizer use by gender, race/ethnicity, and parent education are shown in Table 2. Girls were more likely than boys to say they used to experiment, and boys were more likely than girls to say they used because of boredom, to have a good time with their friends, because it looks cool, or to feel good/get high. Differences by race/ethnicity suggested that Whites were more likely (than Black and Hispanics) and Others were more likely (than Hispanics) to report taste; Blacks and Others were more likely (than Whites and Hispanics) to report because it looks cool; Blacks were less likely to report have a good time (compared to all other groups), to relax (compared to all other groups), to help quit regular cigarettes (compared to Hispanics and Others), because regular cigarettes use is not permitted (compared to Whites and Others), and being hooked (compared to all other groups); Hispanics were less likely (than Whites and Others) to report feel good or get high. Three of the ten reasons differed by parent education: Students whose parent(s) graduated from college were more likely to report because it tastes good and to have a good time with friends, and less likely to report using to relax, compared to students with lower parent education.

4. Discussion

Overall, results suggest that adolescent decisions to vape are based on curiosity, taste, and pleasure, which is somewhat consistent with the existing but limited research on adolescent experimentation with e-cigarettes (Ambrose et al., 2015; Kong et al., 2015). Vaping for taste and pleasure (e.g., boredom, to have a good time with friends, and to relax) may be similar to using e-cigarettes for enjoyment, a primary reason found among college students (Saddleson et al., 2016). Reasons associated with quitting or reducing regular cigarette use were not commonly found among US adolescents, echoing other research (Kong et al., 2015). Adoles-

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