

Wisconsin Adolescents' Attitudes, Beliefs, Motivations, and Behaviors Surrounding E-Cigarette Use and Cessation

Brian S. Williams, MD; Jesse T. Kaye, PhD; Karen L. Conner, MPH; Jennifer Bird, PhD; Rob Adsit, MEd; Megan E. Piper, PhD

ABSTRACT

Introduction: Electronic cigarettes (e-cigarettes) are the most common tobacco product used by adolescents, yet no evidence-based cessation treatment for adolescents exists.

Methods: Wisconsin residents aged 13 to 17 (N=227) completed an online survey assessing e-cigarette use, knowledge, motivations around using and quitting, and recommendations for cessation intervention content.

Results: Most of our sample never vaped (76.2%), reporting concerns with health effects and addiction as motivations preventing initiation. Among adolescents who used e-cigarettes, friend use was the main motivation for initiation, and mental health symptoms promoted ongoing use. Motivations for quitting included health harms, cost, and addiction.

Conclusions: This study identified various topics that motivate and demotivate e-cigarette use among adolescents. This information can be incorporated into prevention and treatment strategies tailored to adolescents.

INTRODUCTION

Electronic cigarettes (e-cigarettes) have been the most popular tobacco product used by US middle and high school students since 2014.¹ Use of e-cigarettes exposes adolescents to various toxicants, carcinogens, and fine particles and places them at risk of complications from nicotine, including dependence, deficits in attention and cognition, and mood disorders.²

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Author Affiliations: Center for Tobacco Research and Intervention, University of Wisconsin School of Medicine and Public Health (UWSMPH), Madison, Wisconsin (Williams, Kaye, Conner, Bird, Adsit, Piper); Division of Hospital Medicine and Complex Care, Department of Pediatrics, UWSMPH, Madison, Wisconsin (Williams); Division of Hospital Medicine, Department of Medicine, UWSMPH, Madison, Wisconsin (Williams); Division of General Internal Medicine, Department of Medicine, UWSMPH, Madison, Wisconsin (Kaye, Conner, Adsit, Piper); Carbone Cancer Center, UWSMPH, Madison, Wisconsin (Bird).

Corresponding Author: Brian S. Williams, MD, 600 Highland Ave, H4/418, MC 5108, Madison, WI 53792; phone 608.262.9364; email bswillia@medicine.wisc.edu; ORCID ID 0000-0003-2682-4596

There are limited evidence-based vaping cessation interventions for adolescents, leaving clinicians, parents, and adolescents to do the best they can to support vaping cessation.^{3,4} Most adolescents report using no assistance in vaping cessation attempts.⁵ Thus, there is an urgent need to develop vaping cessation interventions that are effective and appealing to young people.

In September 2022, the Wisconsin Department of Justice finalized a multistate settlement with JUUL Labs to hold JUUL accountable for marketing e-cigarettes to young people.⁶ The current study, funded by the Wisconsin JUUL settlement, was designed to examine adolescents' (1) vaping

risk perceptions and knowledge; (2) motivations for initiation, ongoing use, and cessation; and (3) preferences for prevention and cessation intervention content and delivery. Results from this study will inform future prevention and cessation intervention development.

METHODS

In December 2023, eligible participants aged 13 to 17 years who resided in Wisconsin completed an online survey. Eligible individuals were invited by Centiment, a nationwide survey company, to complete an online survey via email, text, or through a web-based portal. Centiment actively recruits and maintains survey panels, obtaining extensive background profile information to allow for targeted survey recruitment.⁷ Centiment also uses rigorous methods to ensure the consistency of survey responses by panel members.

Participants were presented with a survey description and provided informed assent prior to completing the survey. Survey questions were compiled from national surveys assessing youth tobacco use,^{8,9} in addition to original survey questions. Participants

were categorized by vaping status: never vaped, formerly vaped (reported prior vaping but no use in past 30 days), and currently vape (e-cigarette use within the past 30 days). Based on their vaping status, participants answered questions about motivations for vaping or not vaping, future vaping or quit plans, type and frequency of use, quit attempts, and quit strategies. The full survey is available online at <https://osf.io/jn7xy/>. Participants received \$17.50 for survey completion.

This study was approved by the University of Wisconsin Institutional Board. Descriptive statistics and analyses were performed using R version 4.3.1 (R Core Team) in RStudio version 2023.06.1 (RStudio Team) and SPSS Statistics version 27 (IBM Corp). A coder (JK) used inductive coding to categorize open text responses.

RESULTS

A total of 227 adolescents participated in the study. The mean age of participants was 15.8 years old, and 65.6% identified as female, 69.6% White, 11.5% Black/African American, 67.8% heterosexual, 54.2% from an urban ZIP code, and 53% were in 11th or 12th grade (Table 1). Most participants reported no lifetime vaping (n = 173, 76.2%); 54 (23.8%) respondents reported vaping at least once. Youth who currently vape (n = 28, 12.3%) reported vaping a mean of 16.8 days during the last 30 days (SD 11.9, mode = 30); 39% reported daily use, and 42.9% reported vaping 10 or more times per day. Most adolescents who formerly vaped (60%) reported not having vaped in the past year.

Vaping Risk Perceptions and Knowledge

Participants (n = 227) reported vaping was “very” or “extremely” harmful to physical health (84%) and mental health (73%). In comparison to smoking cigarettes, 22% reported vaping was less harmful, 44% reported vaping and smoking were equally harmful, and 34% reported vaping was more harmful. Almost all (91%) reported that becoming addicted to vaping was “somewhat” or “very” likely. The most common themes among responses to the open-ended question, “What are the harms of vaping that you are most worried about?” were lung health/damage, cancer, nonspecific health effects, addiction, and mental health disorders (depression or anxiety). Participants indicated that their main sources of information on vaping risks included the internet/social media (78%), school (77%), parents/family (62%), doctors/health care (57%), and TV (45%). Only 10% of respondents knew of any programs to help adolescents quit vaping.

Vaping Initiation

Individuals with a history of vaping reported that “friend use” was the most common reason for initiation (75.9%), with curiosity (55.6%), family member use (25.9%), and flavors (20.4%) also motivating initiation. No participants reported initiating e-cigarettes to quit cigarettes or another tobacco product (Table 2).

Table 1. Participant Demographics, N = 227

Age, Mean (SD)	15.8 (1.3)
Age, n (%)	
13	18 (7.9%)
14	29 (12.8%)
15	25 (11.0%)
16	49 (21.6%)
17	100 (44.1%)
Grade, n (%)	
6–8	35 (15.4%)
9–10	61 (26.9%)
11–12	128 (53.4%)
College	2 (0.9%)
Gender, n (%)	
Male	62 (27.3%)
Female	149 (65.6%)
Nonbinary, transgender, gender nonconforming	15 (6.6%)
Race, n (%)	
White	158 (69.6%)
Black/African American	26 (11.5%)
Asian	11 (4.8%)
American Indian or Alaskan Native	3 (4.8%)
Native Hawaiian or Other Pacific Islander	2 (0.9%)
More than 1 race	22 (9.7%)
Unknown, not reported, or Other	10 (4.4%)
Latino/Hispanic, n (%)	32 (14.1%)
Geographic distribution, n (%)	
Large rural	20 (8.8%)
Small town/rural	43 (18.9%)
Suburban	21 (9.3%)
Urban	123 (54.2%)
Sexual orientation, n (%)	
Heterosexual	154 (67.8%)
Bisexual	37 (16.3%)
Gay or Lesbian	13 (5.7%)
I don't know	16 (7.0%)
None of these describe me	6 (2.6%)
Vaping behavior, n (%)	
Never user	173 (76.2%)
Former user	20 (8.8%)
Current user	28 (12.3%)

Note: Geographic distribution is classified by Rural-Urban Commuting Areas (RUCA) ZIP codes using the R package ruca.¹⁰

Among individuals who reported never vaping, 97% indicated they would “probably not” or “definitely not” try vaping in the next 12 months. Similarly, 94% also reported “probably not” or “definitely not” when asked, “If one of your best friends were to offer you a vape, would you try it?” When these adolescents were asked, “Why do you think you have never tried vaping,” the most common themes from the 169 free-text responses were health concerns and addiction.

Current Vaping

Among individuals who currently vape, the most common reasons for ongoing vaping were “because I feel anxious, stressed, or

depressed” (39.3%); “a friend uses them” (35.7%); “I can use them unnoticed at home or at school” (28.6%); “flavors” (25%); and “to get a high or buzz from nicotine” (25%) (Table 2). Respondents perceived they were moderately addicted to vaping (mean 4.3, SD 3.3 on 10-point scale: 0 = “not at all” to 10 = “extremely”). The most common sources for obtaining e-cigarettes were “have someone else buy them” (46.4%) and “from a friend” (39.3%). Only 21.4% reported buying e-cigarettes for themselves. Of those who purchased their own e-cigarettes, gas stations and smoke shops were the most common purchase locations.

Quitting Vaping

Among youth who formerly vaped, the primary motivations for quitting were “e-cigarettes are harmful to my health” (40%), “e-cigarettes are not cool” (40%), and “e-cigarettes are addictive” (25%) (Table 3). These adolescents perceived they had been minimally addicted to vaping (mean 1.7, SD 2.4 on 10-point scale: 0 = “not at all” to 10 = “extremely”), and 70% did not use any resources to quit vaping.

Among youth who currently vape, 82.1% were thinking seriously about quitting vaping, 65% reported considering quitting in the next 6 months. Primary reasons for wanting to quit were health harms (52.2%), addiction (52.2%), and cost (43.5%) (Table 3). Respondents reported that if they were to quit today, they would want help from “friends” (43%), “parents or family members” (40%), or to “quit by myself, without help from others” (28%). Only 14.2% reported they would want a health care professional to help.

Vaping Prevention and Treatment Intervention Design

Participants were asked, “If you could design a message to encourage teenagers not to vape, what would your main message be?” The most common themes included (1) negative health consequences, (2) addiction, (3) social unacceptability, and (4) mental health consequences. In addition, participants were asked about messaging they would not pay attention to, and respondents suggested avoiding simple, nonspecific phrases like “just don’t vape” or “it’s bad for you” and avoiding messages delivered by adults instead of youth.

DISCUSSION

This survey of 227 Wisconsin adolescents assessed vaping risk knowledge, motivations for initiation, ongoing use, quitting, quit

Table 2. Factors That Motivate Vaping

Motivations for Initiation Among Ever Users	Motivations for Continued Use Among Current Users
Friend use – 75.9%	Feeling anxious, stressed, or depressed – 39.3%
Curiosity – 55.6%	Friend use – 35.7%
Family member use – 25.9%	Able to use unnoticed at home or school – 28.6%
Flavor availability – 20.4%	To get high or a buzz from nicotine – 25.0%
Feeling anxious, stressed, or depressed – 16.7%	Flavor availability – 25.0%
Able to use unnoticed at home or school – 16.7%	Addiction – 21.4%
Use them to do tricks – 14.8%	Use them to do tricks – 21.4%
Use seen on TV, online, or in movies – 14.8%	Cost less and easier to get than cigarettes – 10.7%

Table 3. Factors That Motivate Quitting Vaping

Former Users’ Motivations for Quitting	Current Users’ Motivations for Quitting
Health harms – 40%	Health harms – 52.2%
E-cigarettes are not cool – 40%	Addiction – 52.2%
Addiction – 25%	Cost – 43.5%
Vaping impact on sport/other performance – 15%	Fear of “getting caught” – 26.1%
Cost – 10%	Issues with my health – 21.7%
Issues with my health – 10%	Vaping impact on sport/other performance – 17.4%
E-cigarettes are illegal – 10%	Impact on school performance – 13.0%
Impact on school performance – 10%	Difficulty obtaining – 13.0%

strategies, and potential content for a prevention and cessation intervention. Health harms and addiction were identified as common themes that youth perceive as powerful motivators for both discouraging initiation and promoting quitting. Most participants reported never using e-cigarettes (76%), primarily due to concerns about health harms and addiction. Among youth who formerly used e-cigarettes, concern about health harms was the most common motivation for quitting. Adolescents recommended incorporating the themes of health harms, addiction, and mental health consequences in the design of cessation interventions. These findings are consistent with prior literature¹¹ and suggest these themes be incorporated into interventions to prevent initiation or escalation of use, as well as to motivate quitting among adolescents.

E-cigarette use by a friend was identified as the main reason for initiating use and was a common reason for ongoing use. This is consistent with prior work¹² and highlights the importance of individuals having effective “refusal skill” strategies to counteract peer pressure. In addition, while anxiety, stress, and depression were not common reasons for initiating use, they emerged as important motivations for ongoing use. An intervention that can help users identify healthier coping strategies to address these symptoms may reduce the influence that mental health symptoms have on promoting continued use.

Most youth who currently vape endorsed a desire to quit vaping, but only 10% of the sample was aware of any vaping cessation resources. Developing an intervention that can reach adolescents who vape is critical. Participants reported receiving information about e-cigarettes from social media or other online platforms,

which suggests these venues can serve to disseminate a vaping cessation intervention.

This study has several limitations. The population was a small convenience sample based on an existing participant pool and, thus, may not be representative of adolescents in Wisconsin, though our sample did show geographic diversity. Additionally, given that e-cigarette use is illegal for adolescents, respondents may have reported lower rates of use and future use intentions. Further, since the majority of the sample had never vaped (76%), the overall results may be less reflective of the attitudes of youth with experience vaping.

CONCLUSIONS

Our study identified several themes that motivate e-cigarette initiation and ongoing use among adolescents, including peer pressure and mental health symptoms. Factors that discouraged e-cigarette initiation and motivated quitting included concerns about health harms, addiction, cost, and social unacceptability. These themes can be incorporated into vaping prevention and cessation interventions for adolescents.

Funding/Support: Funding for this study was provided by Wisconsin Department of Health Services, MSN276077.

Financial Disclosures: Megan Piper, PhD, reports receiving consulting fees from Temple University, New York University, University of South Carolina, and University of Waterloo and grand rounds speaker payments or honoraria from University of Alabama Birmingham and Roswell Park.

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