

Vaping Habits of College Students

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Abstract

Although the first electronic cigarette-like device was patented in the 1930s, the electronic nicotine delivery systems (ENDS) seen today did not penetrate the US market until 2006 (Consumer Advocated for Smoke Free Alternatives Association; Fadus et al., 2019). Before the emergence of ENDS, nicotine use had plummeted, but the invention and popularization of vapes caused its nationwide resurgence (Center for Disease Control and Prevention, 2019). While ENDS were originally purposed to help smokers quit cigarettes and eventually nicotine altogether, a troubling demographic of vape users is “Zoomers”, or those born between 1995-2015. Currently, most behavioral vaping studies focus on middle school and high school students, while few examine older Zoomers. We developed a survey to uncover college students’ opinions on vaping, as well as to quantify the frequency of vaping at the college level. In 2020, we recruited Millersville University students to complete the survey. Out of all responses (n=569), 41% of students have vaped, with 24% of all participants being active vapers. Additionally, we asked all respondents, regardless of vaping habit, if they would be less likely to vape if presented with information regarding the effects of vaping. We discovered, if presented with that information, those who do not currently vape are much more likely to not vape in the future (78%; n=435) than those who already actively vape (40%; n=134). The data from this survey suggest that students must be educated on vaping, and educated before they start vaping, in order for them to make informed decisions on the effects of vaping on their bodies.

The electronic nicotine delivery system (ENDS), colloquially referred to as a vape, first entered the US market in 2006 (Consumer Advocated for Smoke Free Alternatives Association). Vapes were originally purposed as a cigarette-free alternative for adult smokers, but their popularization reached an unintended demographic – American youth. One 2017 study revealed 2.1 million American youths tried vaping that calendar year; in 2018, that number rose to 3.6 million (U.S. Dept. of

Health and Human Services, 2016; Centers for Disease Control and Prevention, 2019). Additionally, in 2015, The United States surgeon general reported a 900 percent increase in youth ENDS use, while almost half had never smoked a traditional cigarette.

Before the widespread use of ENDS, nicotine was inaccessible to minors and young adults; the conspicuous shape of a cigarette carton and the lingering scent of smoke made it difficult for teens and young

adults to use tobacco and escape detection. Now, vapes can be mistaken for flash drives, allowing a whole new generation, who never struggled with nicotine addiction in the first place, to become addicted and at a far younger age. Starting nicotine at a younger age, combined with the lack of regulation of ENDS through the FDA, has caused millions of teens and young adults to become exposed to unknown health effects. This study aims to uncover college students' opinions on nicotine use and to understand their vaping habits, which may assist in developing preventative education as well as inform *in vitro* experimentation.

Methodology

A survey was developed to assess vaping habits and opinions of students at Millersville University of Pennsylvania. Millersville University Institutional Review Board approved the survey and its dissemination. Students answered 15-20 questions. The number of questions answered depended on the answer given to previous questions, namely, whether the respondent has ever vaped. Survey participants were sorted into one of three survey tracks – individuals who have never vaped, individuals who currently vape, and individuals who quit vaping. Additionally, we subdivided current vapers as those who frequently vape and those who socially vape.

We disseminated the confidential survey to students via email. The survey platform collected email addresses to ensure the survey was taken only once by each respondent, but the email addresses were not linked to the survey responses, and the researchers did not have access to the email addresses. In total, 569 responses were collected from Millersville University students between July 2020 and December 2020.

Results

569 Millersville University students were surveyed. Of all participants, 62% were 18-20 years old, 28.1% were 21-23 years old, and 9.9% were 24 years or older. 41.1% of all students reported vaping at least once (See Appendix A; Table 1), with the age group from 21-23 years having the highest proportion of vapers (49.3%). The age groups of 18-20 and 24 years or older had similar proportions of vapers (37.6%; 39.3%; Table 1). Additionally, all age groups had similar proportions each of social, frequent, and past vapers (Table 1).

Students were asked, regardless of vaping habit, whether learning more information about the effects of vaping would make them less likely to vape. More than 70% of former vapers and nonvapers stated that they would be less likely to vape. However, less than 40% of current vapers felt they would be deterred, even though more than one third of frequent vapers feel the habit has affected their health (Appendix B; Table 2). Interestingly, 58% of current vapers would still recommend vaping to a smoker looking to quit cigarettes even though 80% believe vaping leads to nicotine addiction.

Discussion

The results of this survey demonstrated more than 40% of college students have vaped, with the highest proportion of vapers being 21-23 years old. This age group may have the highest proportion due to their age when JUUL, one brand of vape, first entered the market. These participants would have been around 16-18 years old at that time, and the popularization of the JUUL in the years following its release may have made it more appealing to this cohort of students that would have recently reached the age they could legally buy nicotine products. The lowest proportion of vapers falls within the 18-20 age group, which may be a result of the SARS-CoV-2 pandemic. This

pandemic shut down many schools and institutions beginning in March 2020 and extending through the time this survey was distributed. Many students in the 18-20 age group had their college experience greatly altered, and many have not had the chance to live on campus with other students. Fewer social interactions between students may have decreased the likelihood of peer-influenced vape use.

Concerningly, less than 40% of current vapers would be less likely to vape if presented with information regarding its health effects. In fact, current vapers were much more likely to be unsure of how learning new information would affect their habits. Particularly troublesome, a significant proportion of these current vapers feel vaping has negatively impacted their health.

Together, these statistics show the grim epidemic of vaping in the college setting. The data collected from this survey suggest that to effectively educate youth and young adults about the effects of vaping, education needs

to take place before they begin vaping. If they already vape, students are less confident education would change their habits. Future studies should more closely examine the different demographics within college students. This study looked only at age, but other factors such as class standing, race, ethnicity, and employment status may yield different patterns within the total sample. Additionally, finding what age students begin vaping may provide insight into more successful intervention.

Conclusion

Though the Atlantic League did not play baseball in 2020 due to the COVID-19 pandemic, their continued growth in years to come is to be expected. With a great emphasis placed on player development and career revitalization, coupled with an exclusive partnership with Major League Baseball which ensures the popularity of the league for future generations, there is only room to grow.

References

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Appendix A

Table 2. Summary statistics of a Chi-Square Test of Independence showing the association between the different vaping groups and opinions on vaping. DF= degrees of freedom; statistical significance at $p < .05$. N/A= Not Available.

	Total N=569	18-20 Years	21-23 Years	24+ Years	Chi-Square		
Characteristic	n (%)	n (%)	n (%)	n (%)	DF	Value	p
Have Vaped					2	6.31	.047
• Yes	234 (41.1)	133 (37.7)	79 (49.4)	22 (39.3)			
• No	335 (58.9)	220 (62.3)	81 (50.6)	34 (60.7)			
Vaping Category					4	5.52	.238
• Frequent	63 (26.9)	34 (25.6)	20 (25.3)	9 (40.9)			
• Socially	71 (30.3)	39 (29.3)	29 (36.7)	3 (13.6)			
• Quit	100 (42.7)	60 (45.1)	30 (38.0)	10 (45.5)			
Less likely to vape if given information					4	5.95	.203
• Yes	391 (68.7)	232 (65.7)	118 (73.8)	41 (73.2)			
• No	89 (15.6)	56 (15.9)	25 (15.6)	8 (14.3)			
• Unsure	89 (15.6)	65 (18.4)	17 (10.6)	7 (12.5)			

Appendix B

Table 2. Summary statistics of a Chi-Square Test of Independence showing the association between the different vaping groups and opinions on vaping. DF= degrees of freedom; statistical significance at $p < .05$. N/A= Not Available.

Characteristic	Never Vaped	Social Vapers	Frequent Vapers	Past Vapers	Chi-Square		
	n (%)	n (%)	n (%)	n (%)	DF	Value	p
Vaping affected own health					6	11.89	.018
• Yes		12 (16.9)	23 (36.5)	17 (17.0)			
• No		39 (54.9)	21 (33.3)	50 (50.0)			
• Unsure	N/A	20 (28.2)	19 (30.2)	33 (33.0)			
Less likely to vape if given information					6	72.95	<.0001
• Yes	265						
• No	(79.1)	31 (43.7)	22 (34.9)	73 (73.0)			
• Unsure	40 (11.9)	18 (25.4)	20 (31.7)	11 (11.0)			
	30 (9.0)	22 (31.0)	21 (33.3)	16 (16.0)			
Recommend vaping to smoker?					6	63.38	<.0001
• Yes	71 (21.2)						
• No	179	39 (54.9)	39 (61.9)	35 (35.0)			
• Unsure	(53.4)	19 (26.8)	14 (22.2)	48 (48.0)			
	85 (25.4)	13 (18.3)	10 (15.9)	17 (17.0)			
Believe vaping causes addiction?					6	32.51	<.0001
• Yes	298						
• No	(89.0)	58 (81.7)	49 (77.8)	93 (93.0)			
• Unsure	6 (1.8)	9 (12.7)	9 (14.3)	4 (4.0)			
	31 (9.3)	4 (5.6)	5 (7.9)	3 (3.0)			

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