

Research Article

Designing a University Nicotine Cessation Program to Address Consumption Among Undergraduate Students

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Abstract

Background: The aim of this study was to understand student's nicotine consumption habits in order to design a campus nicotine cessation campaign. **Methods:** This study employed a quantitative cross-sectional research design. Over the course of 16 days, a survey was used to collect 146 responses from SU students. This 63-question survey was created to explore the preferred nicotine use patterns of undergraduate students at Shenandoah University's. **Results:** Of the students surveyed, 41% reported having used or tried a nicotine product. Students reported being the most likely to have tried smoking an e-cigarette/vape product, and least likely to try using chewing tobacco or snuff products. Most first-time nicotine use for surveyed students occurred between the ages of 15-18 years. **Conclusion:** The data highlighted a need for greater tobacco education on this campus. The results guided the creation of the educational materials to ensure the information was relevant to the needs of the community. Additionally, a nicotine cessation program was created for SU's Wilkins Wellness Center.

Keywords

Nicotine Use, Health Education, Campus Health, Nicotine Cessation Programs

1. Introduction

Tobacco use is currently the leading cause of premature death in the United States killing approximately 443,000 Americans each year [1]. Eighty eight percent of current adults that consume nicotine products daily report trying their first cigarette by the age of 18 [1]. In December of 2019, the federal tobacco laws in the United States raised the legal age to purchase nicotine products from 18 to 21 years of age [2]. This update impacted the way that colleges and universities address nicotine and tobacco use on their campuses. The propensity for young adults to experiment with nicotine products leads to college-aged students being an important age group to conduct research with and to monitor use in order to understand patterns of behavior and tailor appropriate in-

terventions for this population.

Prior to this change most college aged students were legally able to purchase and consume nicotine products, even if there were campus restrictions on when or how this could take place. As a result of this legal change, colleges and universities have been called upon to respond in a number of ways. Not only do they need to address an increased number of possible conduct violations within residence halls, but there is also an increased need to support cessation goals and provide more targeted education. As a result, Shenandoah University, a small private Liberal Arts institution in Winchester, VA, designed a nicotine cessation program around an understanding of the campus's current nicotine habits.

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2. Background

According to the National Center for Education Statistics [3], there are approximately 12.3 million students currently enrolled in a 4-year institution in America between the ages of 18-21, making up more than half of all students attending a post-secondary institution. In 2019, the Centers for Disease Control [4] reported that 8 out of every 100 young adults ages 18-24 smoke cigarettes. As many as 984,000 of America's smokers are attending classes on a college campus, thus creating an opportunity for health education and cessation interventions. There is limited research on college student smoking behaviors, and much of the current information is related specifically to cigarette consumption. Leaving a large gap in data about a new and very popular form of nicotine use, e-cigarettes or vapes. While more data is needed, there is sufficient evidence to support that the rates of e-cigarette use on college campuses is on the rise [5].

Smoking habits of college students are diverse and still not well understood [6, 7]. One common theme among students is the social smoking phenomena where students only smoke when they go out or only choose to smoke when in a social setting, also referred to as social smoking [6, 7]. Social smokers consume smaller quantities of nicotine products on fewer days during a week compared to smokers with more regular consumption habits [6].

A study in 2015 interviewed college students and was able to identify 5 distinct types of smokers on a college campus [8]. "Two daily smoker identities, light and regular smokers, and three occasional smoker identities, stress, social, and drunk smokers" [8]. The latter 3 types of smoker, also known as social smokers, admit to participating in regular social smoking, but do not consider themselves to be actual smokers [8]. Students failing to recognize and label their smoking habits is a common theme among casual college-aged smokers. Nearly one-third of students that consumed a cigarette in the previous 30 days did not identify themselves as being a smoker [6, 7]. This is likely related to the fact that social smokers report high rates of confidence that they could quit smoking when desired, and low rates of motivation to actually kick the habit when asked about quitting [6].

It is well known that smoking can lead to negative health outcomes such as heart disease, lung cancer and stroke [9]. While consuming smokeless tobacco can cause oral disease, cancer of the mouth, esophagus or pancreas [9]. The concept of social smoking, or smoking less regularly, is not an effective measure to prevent these dangerous outcomes. There has been a documented connection between even light smokers and myocardial infarction [10]. With between 33 and 50 percent of individuals that try cigarettes transitioning into regular use there is a clear need to better understand college student tobacco use [11].

The most recent National Tobacco Survey conducted by the CDC discusses the urgency to address tobacco use among U.S. youth [12]. In particular, this report highlights that if cigarette smoking continues at the current rate among youth that ap-

proximately 5.6 million of today's youth will die early of smoking-related illness [12]. Additionally, e-cigarette use among youth continues to be the most commonly used tobacco product [13].

3. Methods

3.1. Participants, Procedures and Timeline of Survey

An online survey was administered to undergraduate students currently enrolled in courses at Shenandoah University. Shenandoah University (SU) is a small, private liberal arts college located in Winchester, VA. It currently has about 4,000 undergraduate, graduate and doctoral students enrolled in a myriad of academic programs. SU has three separate locations as well as several online programs to meet the needs of students. Information was collected from a 63-question survey on current students related to their nicotine use and overall knowledge about nicotine (vaping, smoking, chewing etc.). The survey questions collected both qualitative and quantitative data surrounding current nicotine habits for this study population.

3.2. Research Instrument

Over the course of 16 days, a 63 question survey was administered via the online survey tool, SurveyMonkey. It was delivered to undergraduate students between the ages of 18-21 years, and participation was encouraged through word of mouth and online advertising. Shenandoah University's Office of Marketing and Communication shared the survey through their daily newsletter sent to the student body, and leaders from the Division of Student Affairs disseminated it among their students. Participation was also encouraged through a gift card raffle that individuals could opt into after completing the anonymous survey.

The survey asked questions about student's nicotine use through various categories including; cigarettes, cigars/cigarillos, hookah/water pipe, chewing tobacco, and e-cigarettes or vape. Qualitative and quantitative data was collected about frequency of use, patterns of behaviors, and beliefs about the various products.

3.3. Data Analysis

In total, 179 survey responses were collected, including 146 completed surveys. Descriptive statistics were calculated on the collected data in SPSS version 25. Details of the analysis are found below.

4. Results

The average age of survey participants was 20 years old and

were a member of SU's College of Arts and Sciences. Some of the other school's that participated included: the Conservatory, School of Business, and the Eleanor Wade Custer School of Nursing. 110 females completed the survey com-

pared to only 36 males. Participants were also most likely to be Caucasian (86%), with other students self-identifying as Asian (7.5%), American Indian or Alaskan Native (3%), Black or African American (7.5%) or other (4%). See [Table 1](#).

Table 1. Study Demographics.

Demographic Categories	Frequency	Percentage
Sex		
Male	36	25
Female	110	75
Transgender	0	0
Non-binary/non-conforming	0	0
Age		
<17	0	0
18	38	26
19	31	21
20	36	25
21	27	18
>21	14	10
Race		
Asian	11	7
African or African American	11	7
American Indian or Alaskan Native	4	3
Native Hawaiian or Pacific Islander	0	0
Caucasian or White	126	80
Other	6	3
Year in College		
Freshman	44	30
Sophomore	33	23
Junior	30	20
Senior	39	27
School of Study for Major		
College of Arts and Sciences	88	60.5
School of Nursing	16	11
School of Education	6	4

Demographic Categories	Frequency	Percentage
Conservatory	17	12
School of Business	18	12
Division of Applied Technology	1	0.5

For the purpose of this study, “trying” a product is defined as: smoking or using a device to consume any amount of product, even one or two puffs. Among participants, 41% reported having used or tried a nicotine product. Students reported being the most likely to have tried smoking an e-cigarette/vape product, and least likely to try using chewing tobacco or snuff products. Most first-time nicotine use for SU students occurred between the ages of 15-18 years in all categories. See [Table 2](#).

Table 2. *Reported Cigarette Use.*

Tobacco Use Questions	Frequency	Percentage
Have you ever tried smoking a cigarette tobacco product?		
Yes	49	34
No	97	66
How old were you when you first tied cigarette smoking?		
10 years or younger	1	2
11-14 years	6	11
15-18 years	33	61
19-21 years	14	26
21> years	0	0
How many cigarettes have you smoked in your entire life?		
1 or more puffs, but never a whole cigarette	26	48
1 cigarette	4	7
2 to 5 cigarettes	10	19
6 to 15 cigarettes (about ½ a pack total)	2	4
16 to 25 cigarettes (about 1 pack total)	2	4
26 to 99 cigarettes (more than 1 pack)	4	7
100 or more cigarettes (5 or more packs)	6	11

4.1. Cigarette Use

Of the participants surveyed, 33% have tried a cigarette tobacco product, 49 students total. Almost half of students shared that they had only had a few puffs, and never finished an entire cigarette - whereas 11% had smoked 5 or more packs in their life. Menthol cigarettes are not a popular choice among cigarette users with 72% having never tried them. The most common place that students acquired their last cigarette was from a friend.

For students that had never smoked a cigarette only 2% reported being curious about trying one, and 71% reported not being curious about trying one and 92% of respondents reported they definitely will not try a cigarette in the future. Upon exploring some family history, 50% of students reported that they have at least one family member that smokes cigarette products. See [Table 2](#).

4.2. Cigars or Cigarillos Use

In total, 37 of the 146 participants (25%) reported trying a

cigar or cigarillo in their life. Of those that have tried a cigar/cigarillo, 39.5% tried 1 or more puffs, but never a whole cigar/cigarillo and 23% reported consuming 2 to 5 whole cigars/cigarillos in their lifetime. Half of all cigar/cigarillo users received their last product from a friend, and 42% purchased their last product from a convenience store or gas station.

Of those surveyed, 109 students reported never having tried smoking a cigar or cigarillo, and of those students, only 13 have ever been curious about trying one. Of those surveyed, 77% responded that they have never been curious to try, and 29% of respondents reported having family members that use cigar or cigarillo products. See [Table 3](#).

Table 3. Reported Cigars or cigarillos Use.

Cigars or cigarillos Use Questions	Frequency	Percentage
Have you ever tried smoking a cigar, cigarillo or little cigar?		
Yes	37	25
No	109	75
How many cigars or cigarillos have you smoked in your life?		
1 or more puffs, but never a whole cigar or cigarillo	15	39
1 cigar or cigarillo	4	11
2 to 5 cigars or cigarillos	9	24
6 to 15 cigars or cigarillos	5	13
16 to 25 cigars or cigarillos	2	5
More than 25 cigars or cigarillos	3	8
Where did you buy/acquire the cigar or cigarillo product?		
A gas station or convenience store	16	42
A grocery store or drugstore	0	0
On the Internet	0	0
A vape shop or specialty store that only sells e-cigarettes	1	3
From a family member	2	5
From a friend	19	50
From someone that is not a family member or friend	0	0
Other	0	0
Have you ever been curious about smoking a cigar or cigarillo?		
Definitely yes	1	1
Probably yes	12	11
Probably not	12	11
Definitely not	84	77

4.3. E-cigarettes or Vape

The most popular tobacco product among Shenandoah students was an e-cigarette or vape, with 58% of participants reporting that they have tried an e-cigarette or vape. Of the different varieties of vape products, 67% prefer an e-cigarette

that uses pre-filled pods or cartridges (i.e. JUUL). Students were asked about why they chose to use a vape or e-cigarette and the most common reason was because they were curious about them (67%), followed by because a friend or family member did it (44%). Most first-time e-cigarette or vape use for SU students occurred between the ages of 15-18 years.

Of the 61 students that reported never trying a vape or

e-cigarette 3% reported being curious about trying a product, while 72% reported not being curious about trying them. No respondent reported that they would try a product soon, and

86% said they would definitely never try a vape. Finally, 84 of the 146 participants reported having a family member that uses vape or e-cigarette products. See [Table 4](#).

Table 4. *Reported E-cigarettes or Vape Use.*

E-cigarettes or Vape Use Questions	Frequency	Percentage
Have you ever tried smoking an e-cigarette or vape?		
Yes	85	58
No	61	42
How old were you when you first tried an e-cigarette or vape?		
10 years or younger	0	0
11-14 years	7	8
15-18 years	61	72
19-21 years	16	19
21> years	1	1
Which of the following best describes the type of e-cigarette that you use?		
A disposable e-cigarette	17	18
An e-cigarette that uses pre-filled pods or cartridges	50	54
An e-cigarette that you refill with liquids	11	12
A mod system	5	5
I don't know what type	10	11
Have you ever been curious about smoking an e-cigarette or vape?		
Definitely yes	2	3
Probably yes	5	8
Probably not	10	17
Definitely not	44	72

4.4. Hookah or Water Pipes

Only 21 participants reported having tried smoking tobacco through a hookah or water pipe and 5% of the non-users reported being interested in trying hookah/water pipe in the future. In this study, this was the nicotine option students reported being the most curious about trying. In total, just 4% of the respondents have a family member that use hookah/water pipes. See [Table 5](#). Most first-time hookah or water pipe use for SU students occurred between the ages of 15-18 years.

Table 5. *Hookah or water pipes Use.*

Hookah or water pipes Use Questions	Frequency	Percentage
Have you ever tried hookah or a water pipe?		
Yes	21	14
No	125	16
How old were you when you first tried hookah or a water pipe?		

Hookah or water pipes Use Questions	Frequency	Percentage
10 years or younger	0	0
11-14 years	3	14
15-18 years	15	72
19-21 years	3	14
21> years	0	0

4.5. Chewing Tobacco or Snuff

Chewing tobacco or snuff was the least popular reported choice among the students, with only 15 students reporting having tried the product. Of the respondents, 91% of partici-

pants reported never being curious about trying chewing tobacco or snuff, and 96% shared that they would definitely never try it. In total, 19.8% of respondents have a family that uses chewing tobacco or snuff. Most first-time chewing tobacco or snuff use for SU students occurred between the ages of 15-18 years. See [Table 6](#).

Table 6. Chewing Tobacco or Snuff Use.

Chewing Tobacco or Snuff Use Questions	Frequency	Percentage
Have you ever tried chewing tobacco, snuff or dip?		
Yes	15	10
No	131	90
How old were you when you first tried chewing tobacco, snuff or dip?		
10 years or younger	0	0
11-14 years	2	13
15-18 years	8	54
19-21 years	5	33
21> years	0	0
Have you ever been curious about trying chewing tobacco, snuff or dip?		
Definitely yes	2	1
Probably yes	4	3
Probably not	5	4
Definitely not	120	92

4.6. Reasons for Trying or Abstaining from Nicotine Use

Outside of the data collected about actual tobacco use, the survey also asked qualitative questions regarding student habits. Respondents that have never used a nicotine product

were asked to share why they made this decision; the most common response was “I am not interested in using a nicotine product” (47%) followed closely by “Possible negative health outcomes” (46%). Nicotine users were also asked why they had chosen to use it in the past. They reported that they use them in “social settings” (40%), while consuming alcohol (21%) and for stress management (19%). See [Table 7](#).

Table 7. *Reasons for Trying or Abstaining from Nicotine Use.*

Reasons for Tobacco Use or Non-Use Questions	Frequency	Percentage
If you have never used a nicotine product, why did you choose not to?		
Not interested in nicotine use	70	31
Possible negative health outcomes	68	30
Didn't like the smell of smoke	44	20
Nicotine use is expensive	26	12
Other	15	7
If you have used a nicotine product, why did you use it?		
Social settings	59	25
Weight management	3	1
Stress management	29	12
Trouble Sleeping	3	1
Feeling irritable on edge, grouchy	15	6
Having trouble thinking clearly	8	3
Use nicotine and alcohol together	31	13
Peer pressure	29	12
Other	61	27
What could SU do to assist you in quitting?		
Offer in-person cessation sessions	29	15
Connect me with a counselor	16	8
Connect me with an accountability partner	37	20
Provide programming with education	46	24
Other	61	33

Users were asked if there was anything the University could do to assist them with stopping their nicotine use. The most popular choice was to provide them with educational programming about the dangers of nicotine use (31.5%), followed by connecting students with an accountability partner (25%). The responses of this survey were used to create a nicotine cessation program through Shenandoah University's Wilkins Wellness Center.

5. Limitations

Despite the addition of this research to the lack of literature in this area, this study does have limitations that should be noted. This study was conducted on a rather demographically homogenous group, and would be strengthened by being repeated targeting a broader range of students, including students of color, male students, and students that identify as non-binary or transgender. Gathering responses

from a more diverse population will allow the future outcomes to be reflective of the overall U.S. population, as well as the US population. For example, it is possible that the low numbers of reported chewing tobacco/snuff use can be attributed to the lack of male participants, as culturally this form of tobacco use is more common among males than females. Additionally, the cross-sectional nature of the study design does not allow for follow-up and a deeper understanding of how student behaviors might be impacted over longer periods of time by the change in law and from any interventions implemented at the university level. Lastly, the study does not utilize a validated survey instrument; although a subset of questions were drawn from a validated instrument (CDC's Youth Risk Behavior Survey). Therefore, the survey questions are limited in the conclusions that can be drawn here.

6. Discussion

This study contributes to our understanding of nicotine use among college aged students despite updates in the federal age restrictions for the legal use of these products. This study has highlighted a better understanding of why students reported they chose to consume nicotine products, and also why their peers chose not to consume them. With two-thirds of college students identifying as social smokers there stands to be a large percentage of the young adult population choosing to consume nicotine products smoker [6]. The introduction of more exciting ways to consume nicotine products, like e-cigarettes, is changing the landscape of tobacco use and continuing to encourage new usage.

In 1964 the Surgeon General's warning about tobacco use set clear guidelines surrounding the dangers of tobacco consumption, however we continue to see people pick up the habit [14]. Public health intervention and education needs to focus more heavily on why people choose to use, as well as what types of products are being consumed. Surveys, like the one implemented at Shenandoah University, are an important prevention tool for providing insight into current patterns of behaviors for college students. Trends recognized among college students are often early predictors for trends that will eventually become more pervasive in broader populations [15]. Therefore utilizing the resources on college campuses to develop successful cessation programs may help to prevent continued use and protect individuals from adverse, long-term health outcomes.

Students in this study reported preferring educational programming as a form of aiding in their tobacco use cessation behaviors. Knowing that targeted programs can be created and offered to student from Health Clinics, is a promising approach to reduce tobacco use among this population. The outcomes from this survey can also help the programming be more effective at SU's campuses and other campuses with similar student populations and tobacco use concerns. Campuses do not often have or distribute informational packets about hookah or water pipe use as it is assumed that those are not common forms of tobacco consumption. However, this survey highlights that many students are curious about these options and reported that they are more likely to try it compared to many other tobacco products. Focusing attention, time, and resources on these results will assist the Wellness Center in providing support to students and hopefully increasing rates of cessation among Shenandoah University students. The results of this program were used to create a smoking cessation program on campus. The smoking cessation program included education and cessation around all forms of tobacco use, including e-cigarettes, and hookah, which have gained in popularity among college students.

7. Conclusions

The landscape of nicotine and tobacco consumption on

college campuses has changed and it is important that continued public health efforts work to understand these patterns and address potential risks. Colleges and universities present a unique opportunity to intervene in young people's lives and mitigate risk taking behaviors such as tobacco use. Given that many of the negative health habits established during a young person's time at college or university have the implication to carry over into adult life, it is imperative the campus environment is equipped to mitigate these impacts to the extent possible.

Colleges and universities must also seek to update and adapt their current policies surrounding nicotine use on campus, and it is important to take into account behaviors and preferences. Administration and campus health professionals must work together to create holistic responses including developing prevention strategies, interventions, and sanctions for students in violation. Scientific research around college-aged nicotine use is important as it is a clear indicator about future use as these young adults continue throughout their lives. Continued research is needed to better understand the current and changing needs against the backdrop of the new legal landscape of nicotine consumption. In the meantime, we must continue to work on ways to address and mitigate the risks tobacco consumption poses for our youth.

Abbreviations

CDC	Centers for Disease Control
SU	Shenandoah University

Ethical Clearance

Permission to conduct this study was obtained from the IRB at Shenandoah University.

Author Contributions

Michelle Gamber: Methodology, Supervision, Validation, Writing – review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

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