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Initial Impacts of the COVID-19 Pandemic on Tobacco Use Among College Students in California

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Abstract

Objective: To evaluate the change in tobacco use by college students in California during the COVID-19 pandemic.

Participants: Young adults (18-24 years) currently enrolled in a California college or university (N=212).

Methods: Students recruited through social media posts and by student tobacco advocate members completed an online survey of 59 questions in Spring 2021.

Results: Almost 80% of current tobacco users reported a change in tobacco use during the pandemic. Most current tobacco users who changed their tobacco use reported an increase in use during the pandemic (43.2%) and 38.7% reported a decrease in use.

Conclusion: As a result of COVID-19, many college students changed their tobacco use. As students return to campus and COVID-19 regulations are lifted, this may be an ideal time for prevention and cessation messages, which could include information on health risks associated with tobacco and e-cigarette use, and healthy methods for stress reduction.

Keywords

Tobacco use; College students; COVID-19

Introduction

While technological innovation has undoubtedly had a positive impact on the fields of healthcare and public health, such innovation has been accompanied by the modernization of tobacco products, introducing products such as e-cigarettes to the consumer market. This has had a detrimental impact on the progress made to reduce tobacco product use among youth

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and young adults.[1] Recent national estimates show that 20% of college students currently use e-cigarettes and 28% have used these products in the past year.[1-4]

Whereas it was once believed that youth populations (<18 years old) faced the highest risk of tobacco product use onset, this consensus has shifted in recent years.[5,6] Whether this shift is attributable to a decrease in youth-directed marketing as a result of the Master Settlement Agreement (which forbids Big Tobacco from marketing to youth) or the increase in e-cigarette marketing and access, research now shows that young adults (18-24 years old) are more likely to initiate and/or currently use tobacco products compared to adults.[7-9] This is particularly concerning as using tobacco products, especially at a young age, can lead to increased risk of addiction, cancer, and many other health consequences in the future.[10,11]

As most college students can be categorized as young adults, this makes them an ideal population to study tobacco product use behavior. There are several variables which make college students vulnerable to tobacco product usage, including, but not limited to, targeted marketing and advertisements, tobacco retailer proximity to campus, peer-influences, the mental health of college students, and a new-found lack of parental influence.[12,13] However, there is one variable that has not existed previously which has likely affected both access and use behavior among college students: the COVID-19 pandemic.[14]

COVID-19 necessitated the closure of many college campuses and a transition to online learning which resulted in an exodus of college students away from their campuses and back to their homes beginning in early 2020. For many, in-person learning did not resume until the start of the 2021-2022 school year. In California, a majority of public colleges/universities did not resume in-person learning until 2022. This change in the learning environment may have impacted the frequency of tobacco product use among college students. The shift to distance learning contributed to a greater amount of stress and pressure that students experience from their academic and personal lives.[15] In addition, a change in living conditions such as living with their families, less friends around and less social interaction, and more free time may have also contributed to changes in college tobacco product use as a result of the pandemic.[5]

Given the relative recency of the pandemic, there exists limited research on the effects of COVID-19 on college students' tobacco use.[1] Some studies report a decrease in vaping among college students during the pandemic while other studies suggest that although frequency of use decreased, the quantity of use increased.[5,16] Conversely, other studies showed a general increase in e-cigarette and cigarette use among college students during the pandemic.[17]

Since the impact of tobacco product use is especially devastating for young adults, as it can cause long-term consequences in a developing brain and can increase the risk of addiction in the future, it is crucial to understand the impact of the COVID-19 pandemic on the tobacco product use behavior of college students.[18] The goal of this paper is to determine the impact of the COVID-19 pandemic on tobacco use among college students in California and better understand young adults' tobacco use trends as well as their motivation for use or cessation.

Materials and Methods

Data

The 2021 Campuses Organized and United for Good Health (COUGH) Youth and Young Adult Tobacco Use Survey is an online survey created by the California Youth Advocacy Network (CYAN) and COUGH. The survey was administered online through the platform SurveyMonkey and was open February 2 - March 10, 2021. Informed consent was implied through the completion of the survey. The University of California, Davis Institutional Review Board considered this research as not involving human subjects and therefore exempt from review since this was a secondary analysis of data that was already collected. This comprehensive survey consisted of 59 multiple choice and open-ended questions with a focus on tobacco/nicotine and marijuana use. Participants were recruited through convenience sampling. The survey was advertised on CYAN social media outlets and mailing lists and was distributed by CYAN and COUGH board members online through Instagram and Snapchat Stories. Participants were randomly selected for the opportunity to receive one of ten $50 gift cards. Out of 423 survey respondents, a final sample size of 212 young adult students who self-reported current enrollment in a California college or university was analyzed.

Tobacco use status

Tobacco use status was determined by the question “How do you view your tobacco/nicotine use?” Those who responded “I vape, smoke, or use tobacco/nicotine products at least once every day (or week, month, or casually or in social settings)” were classified as current tobacco users. Those who responded “I've vaped, smoked, or used tobacco/nicotine products a few times (or regularly), but no longer use those products” were classified as former tobacco users. Finally, those who responded with “I have never vaped, smoked, or used tobacco/nicotine products” were classified as never tobacco users.

Former tobacco users were asked about the reasons they stopped using tobacco and could select all that applied from the following list: health concerns related to COVID, health concerns related to E-cigarette or Vaping Use-Associated Lung Injury (EVALI), other health concerns, hard to get access to products, not around friends using tobacco, favorite products are no longer sold, cost of products, staying with parents/or other family members, or other. Former users were also asked about how they quit using tobacco and could select all that applied from the following list: counseling from the health center on college campus, counseling from a medical professional (not on college campus), phone counseling, app or texting program, nicotine replacement therapy, medication, quit kits, cold turkey, or other. Among never tobacco users, students were asked the open-ended question “Why do you choose not to vape, smoke, or use tobacco/nicotine products?”

Current tobacco users were asked about the products they used in the past 30 days and could select all that applied from the following list: e-cigarettes, tobacco cigarette, tobacco cigar, tobacco wrap, hookah, or smokeless tobacco/nicotine. They could also select all that applied about the main reasons they used tobacco products from options that included stress, boredom, like the taste, friendship/peer influence, family/culture, media or image influence,

or other. Current tobacco users also responded to an open-ended question about motivations for continuing to use tobacco.

Specific to how the COVID-19 pandemic impacted tobacco use, current tobacco users were asked “Has the frequency of your tobacco/nicotine use changed since COVID started?” Responses included an increase, decrease, or no change in their use. Among students who reported a change in use, an open-ended follow up question was posed which asked about what contributed to those changes. Students were additionally asked “Has your access to tobacco/nicotine products changed during Covid?” with response options of easier to obtain, more difficult to obtain, or no change.

Covariates

In addition to the outcomes of interest surrounding this study, additional factors were considered that may have influenced the results of the survey. These included demographic information such as the students’ age (18-20, 21-24, 25-30, and 30+ years), race/ethnicity (Asian American/Asian (East, South, Southeast), Black or African American, Hispanic/Latinx, Native Hawaiian or other Pacific Islander, Native American/American Indian/Alaskan Native, Middle Eastern/Arab American, White or European American, or other) (check all that apply option was available), and gender identification (female, male, genderqueer/gender non-conforming, or other) (check all that apply option was available). Additionally, categorical information was collected about the type of institution they attend (community college, California State University, University of California, or private university). Information was collected regarding whether or not the student was a transfer student or an international student, as well information pertaining to their living situation during the pandemic (with parents/relatives, off campus alone or with roommates, or in a campus residence hall).

Analysis Plan

To comprehensively portray the results from the Youth and Young Adult Tobacco Use Survey, both quantitative and qualitative approaches were utilized. For numeric and categorical outcomes that were reported in the survey, percentages were calculated using SAS version 9.4 (SAS Institute, Cary, NC). Qualitative analysis was conducted using the students’ responses to open-ended questions. All responses were independently analyzed through an open coding method, using Grounded theory, with a dual-review.[19] Consensus was reached between reviewers with the entire team reaching agreement during weekly team meetings. Different unifying themes were extrapolated from the pool of diverse responses to categorize recurrent points that the students’ made regarding each question.

Results

Sample Characteristics

Table 1 depicts the demographic characteristics reported by the college students who took part in this survey. Over half of students were younger than 21, which is the legal age to purchase tobacco, and 70.8% were female. Most respondents attended private universities (58.3%) and the rest attended community colleges (21.1%), University of

California institutions (15.2%), or California State Universities (7.8%). As reflected by survey respondents, during the COVID-19 pandemic, most students lived with parents or relatives (57.8%) and many others lived off campus (38.2%). Most students were Asian (42.5%), followed by White (35.9%), and Hispanic/Latinx (26.4%).

Tobacco use status during COVID-19

An estimated 20.2% of college students were current tobacco users and 22.7% were former tobacco users (Table 2). The most common tobacco product used was e-cigarettes (65.7%), followed by cigarettes (31.4%), tobacco wrap (22.9%), hookah (8.6%), smokeless tobacco (5.7%), and cigars (2.9%).

Quitting behaviors among former tobacco users

There were many different motivators for tobacco product cessation. As shown in Table 2, some of the more common reasons included health concerns related to EVALI (46.2%), other health concerns (35.9%), no longer being around friends who use tobacco products during the pandemic (30.8%), and staying with parents/family (28.2%).

Although there was a large variation in the reasons provided for why some students chose to quit using tobacco products, an overwhelming majority of students chose to quit cold turkey (87.2%). Other less common techniques that students used to quit included phone counseling, app or texting program, counseling from the health center on college campuses, Nicotine Replacement Therapy, medication, and quit kits.

Current tobacco users

The most common reasons for why students chose to use tobacco products included stress (64.9%), boredom (51.4%), friends/peer influence (43.2%), taste (35.1%), family/culture (16.2%), media or image influence (5.4%), or other reasons (24.3%) (Table 2). A male student (age 30+ years old) stated, “It's a stress response and at this point just a bad habit.” Multiple other respondents mentioned addiction or having cravings, while others claimed that they only used these products with friends or in party settings. A male student (age 18-20 years old) explained, “I only use e-cigarettes when I am already inebriated, and friends offer them to me. Knowing the dangers of long-term tobacco use, I only use tobacco in combination with marijuana on special occasions”.

Most (81.1%) college students who used tobacco changed their use behavior as a result of the COVID-19 pandemic, including 43.2% that used tobacco more and 37.8% that used it less (Table 2). Living at home during shelter-in-place was a leading factor for both increased and decreased use since the pandemic. A female student (age 21-24 years old) explained, “Due to the pandemic limiting the number of people I could gather with, I mainly hung out with a couple friends who smoke and vape and because of that I have been influenced to use tobacco more”. Other participants stated that limited social gatherings resulted in less use of these products. For example, a female student (age 21-24 years old) said “I don’t leave my house and hardly socialize with anyone”. Other follow up reasons for increased use included using products to cope with stress/anxiety and boredom during shelter-in-place.

Despite the closure of many college and university campuses and the accompanying change in living situation, most students (62.2%) reported no change in access to tobacco products. It was easier for 24.3% of students to obtain tobacco products, and it was more difficult to obtain these products for 13.5% of the students.

Never tobacco users

Among college students who do not use tobacco products, the most common reason was health concerns (Table 2). This included personal health concerns and concern for the health of people around them during shelter-in-place. A female student (age 18-20 years old) answered, “I care deeply about health and wellness and about making choices that reflect my values.” Asthma was also a common health concern reported. The second most common response theme was concern surrounding addiction. A female student (age 18-20 years old) stated, “I know how bad it is for my health and genetically I am more predisposed to addiction”. Other common response themes were not liking the smell of said products, history of cancer in the family, and no interest in using these products.

Discussion

These results offer valuable quantitative and qualitative insight into the impact of the pandemic on tobacco use in college students in California. In this sample of college students, 20% were current tobacco users (mostly e-cigarettes) approximately one year after the pandemic started (Spring 2021). Almost 80% of current tobacco users changed their tobacco use during the pandemic, with slightly more reporting an increase in use (43%), compared with a decrease in use (38%). Living at home, boredom, and stress were common reasons for why students increased their use. Living at home and health risks were common reasons for why students decreased their use.

Living at home was reported as a main reason for both an increase and decrease in tobacco use. When the COVID-19 pandemic started, many changes were made to student’s living situation, medium of education, and day-to-day lives. These drastic changes affected many parts of college students’ lives and likely played a contributing factor in their tobacco use. In our study, almost 60% of college students lived with their parents or relatives after the onset of the pandemic. Due to this distance from their friends using tobacco products, they may have been less incentivized to use tobacco products. Students may have also been concerned about their family members catching them using tobacco products and thus made the decision to not use these products. When students return to campus they may start using again because they are back in their social groups where tobacco use is normalized.

Our finding that a large percentage of current tobacco users changed their tobacco use as a result of the pandemic is consistent with other studies. In a cross-sectional study of youth and young adults who ever used e-cigarettes, over half (56.4%) reported a change in their e-cigarette use.[1] Similarly, in a sample of youth and young adult e-cigarette users in Texas, over half (57.5%) changed their e-cigarette use due to COVID-19.[17] In a slightly different study, college students reported a decrease in the number of days smoked and vaped during COVID, but no change in quantity.[16] This suggests that college students changed their vaping patterns, but their overall consumption did not change.

There seems to be a general consensus in the literature that tobacco use changed during the pandemic, but there are different ways for how it changed. Our study and the Texas study found that among those who reported a change, slightly more youth and young adults increased their tobacco use.[16] In contrast Gaiha's results suggest that substantially more youth and young adults decreased their e-cigarette use. A reason for the differences may be because most students in our study reported no change in access to tobacco, whereas most students in the Gaiha study reported that it was harder to get e-cigarettes during COVID.[1] If students perceive that it is more difficult to get tobacco products, they may quit or decrease their use. Other studies in the literature have also supported a decrease in tobacco use during COVID among youth and young adults.[5,7]

In our study, stress was reported as a primary reason for an increase in tobacco use and for continuing to use tobacco, which is consistent with previous research.[1,20] The onset of the pandemic led to an increase in stress for students influenced by a multitude of factors such as a sudden change in learning/ testing environments, loved ones contracting the virus, and general fear of the rapidly spreading infection.[2]1 Tobacco prevention and cessation messages could include healthy methods for reducing stress that would appeal to young adult college students.

In our study health concerns were reported as a main reason for a decrease in tobacco use, as a motivating factor to quit, and as a main reason for not using tobacco, which is similar to other studies including a qualitative study in youth and young adult e-cigarette users who were seeking treatment and an analysis of Twitter tweets about quitting e-cigarette use.[1,8,9] This motivation factor for quitting tobacco use may stem from the outburst of cases and information regarding the COVID-19 virus that infects the respiratory tract, enticing some students to quit tobacco products to protect their lung health.[21] These results conveyed that knowledge of the addictive properties and respiratory effects deterred certain individuals from starting or continuing use. This is especially important to consider and study further as future interventions can target some of the reasons why college students chose not to use tobacco products and assist other students in quitting their tobacco use.

Based on the data collected from the survey, a majority of students that quit tobacco products quit cold turkey. It has been shown that a large majority of college students prefer to quit cold turkey based on the literature, however, studies have shown that this may not be the most effective method to maintain sustained abstinence.[23-25] One way that public health and colleges/universities can help students quit is to motivate quit attempts. Other techniques and services that were helpful to a few students were phone counseling, app or texting programs, counseling from the health center on college campuses, Nicotine Replacement Therapy, medication, and quit kits. Counseling has helped maintain college student tobacco cessation long-term in the past.[26]

Limitations

The survey provides a general overview of how young adult tobacco use changed during the pandemic but with some limitations. The sample size is fairly small and may not fully represent the college demographic across California. Because the survey was distributed by COUGH Student Leadership Board members and through the COUGH and CYAN social

media account, the respondents may have been less likely to vape, smoke, or use tobacco products. Further research may describe the effects of certain recruitment channels (e.g. various social media platforms, classroom announcements, school wide emails) on tobacco product use. Students following the COUGH and CYAN social media accounts may be involved in tobacco prevention efforts or more aware of the effects of these products. Similarly, COUGH Student Leadership Board members may be better acquainted with individuals who also do not use said products. Also, students attending the same college or university as COUGH members were more likely to respond, explaining an observed higher proportion of responses from students attending private institutions. This may impact the results by overrepresenting specific demographics of students and thus the study would not be as generalizable to the overall population of college/ university students.

Conclusion

Young adult tobacco use is especially detrimental as it can lead to long term addiction and health consequences. E-cigarettes are popular among young adults and the sudden change in lifestyle for college students during the COVID-19 pandemic may have impacted their tobacco use. Indeed, in this study of college students one year after the start of the COVID-19 pandemic, most current tobacco users reported a change in their tobacco use. Health concerns were cited most often as a reason for decreased use and stress was cited most often as a reason for increased use. Therefore, prevention and cessation messages could include information on health risks associated with e-cigarette use and healthy methods for stress reduction.

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Data availability statement:

The data was collected through an online survey titled “2021 Campuses Organized and United for Good Health (COUGH) Youth and Young Adult Tobacco Use Survey,” created by the California Youth Advocacy Network (CYAN) and COUGH.

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Table 1:

Demographic characteristics of California college students (n=212)

Characteristic		Sample size	Percent
Age (years)	18-20	119	56.13%
	21-24	69	32.55%
	25-30	18	8.49%
	30+	6	2.83%
Gender*	Female	150	70.75%
	Male	56	26.42%
	Genderqueer/Gender Non-conforming	6	2.83%
Race/ ethnicity*	Asian American/Asian	90	42.45%
	Black or African American	10	4.72%
	Hispanic/Latinx	56	26.42%
	Native Hawaiian or other Pacific Islander	6	2.83%
	Native American/American Indian/Alaskan Native	6	2.83%
	Middle Eastern/Arab American	11	5.19%
	White or European American	74	34.91%
College/ University	California Community College	43	21.08%
	California State University (CSU)	16	7.84%
	University of California (UC)	31	15.20%
	Private	119	58.33%
Transfer student		38	18.63%
International student		7	3.43%
Living Situation	With parents/ relatives	118	57.8%
	Off campus alone or with roommates	78	38.2%
	In the campus residence hall	6	2.9%

*These questions were “select all that apply”

Table 2:

Quantitative and qualitative responses by smoking status among college students in California (n=212)

Smoking status	Quantitative results	Qualitative results
Former tobacco users (n=46, 22.7%)	Reasons for quitting tobacco (%): • Health- EVALI (46.2%) • Health – other (35.9%) • Not around friends who use tobacco (30.8%) • Staying with parents (28.2%) • Cost (17.9%) • Health-COVID (15.4%) • Hard to access (10.3%) • Other (23.1%)	
Current tobacco users (n=41, 20.2%)	Reasons for using tobacco (%): • Stress (64.9%) • Boredom (51.4%) • Friends (43.2%) • Like the taste (35.1%) • Family (16.2%) • Media (5.4%) • Other (24.3%)	Reasons for using tobacco (sample size): • Enjoyability (10) • Reducing stress/anxiety (10) • Addiction/craving (7) • Social settings (7)
	Change in tobacco use during COVID (%): • Increased (43.2%) • Decreased (37.8%) • Remained the same (18.9%)	Reasons for changing tobacco use during COVID (sample size): Increase: • Stress/Anxiety (7) • Living at home (6) • Boredom (3) • Less social outlets (2) Decrease: • Limited gatherings (6) • Living at home (3) • Health risks (2) • Personal motivation (2)
Never tobacco users (n=116, 57.1%)		Reasons for not using tobacco (sample size): • Health concerns (62) • Addiction (26) • Smell (9) • No interest (7) • Experience with family member’s suffering from tobacco (4) • Asthma and/or other respiratory problems (4)