Usage of Electronic Cigarettes Among Youth in the United States

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+ Summary

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Electronic cigarette usage among youth in the United States has been rising at an increasingly large rate in recent years. Usage rates of electronic cigarettes (hereafter referred to as e-cigarettes) doubled among high school students in a 4 year span from 2013 to 2017. The year following, the percentage of high school students using e-cigarettes doubled again; in 2018, 20.8% of high school students reported using e-cigarettes, as compared to 11.7% in 2017. As reported by the Centers for Disease Control and Prevention (CDC), currently 1 in 5 high school students consistently use e-cigarettes, making them the most-used type of tobacco product among adolescents. Effective marketing strategies of electronic cigarette companies contribute to the large number of youths now addicted to nicotine through electronic cigarette usage. By utilizing social media outlets, sponsoring youth-focused events or opportunities such as scholarships or music festivals, and advertising thousands of flavors, electronic cigarette companies have created positive brand equity for their brands among youth in the United States. Other factors that have contributed to youth electronic cigarette use include a general lack of education about electronic cigarettes and a culture of tobacco usage among adolescents' friends and family.

+ Key Takeaways

- One in five high school students in the United States consistently use e-cigarettes.
- Youth-focused advertising strategies of e-cigarette companies through social media have led to higher youth usage in recent years.
- There are over 15,500 unique flavors of e-cigarettes available, many of which appeal to youth such as cotton candy, bubblegum, and so on.
- Most of the youth who use USB e-cigarettes do not know the product contains nicotine.
- Nicotine use in adolescent years impairs important cognitive regions that control memory and decision-making.
- Thirty percent of youth e-cigarette users will begin using conventional tobacco products within the next 6 months, as compared to 8% of youth non-users.
- Anti-e-cigarette advertising campaigns have the potential to change current youth brand equity of e-cigarette brands.
- Programs that educate youth on the dangers of e-cigarette usage through highly influential aspects of their life such as peers, technology, and family relationships are slowly helping to change the current culture of youth e-cigarette usage.

+ Key Terms

Electronic Cigarettes—Battery-operated devices that are used to inhale an aerosol, which typically contains nicotine (though not always), flavorings, and other chemicals. Also known as e-hookas, hookah pens, vape pens, e-cigs, electronic nicotine delivery systems (ENDS), etc.

Aerosol—The vapor that users inhale and exhale from the device. Aerosol contains harmful substances including nicotine, a carcinogenic chemical called diacetyl, volatile organic compounds, cancer-causing chemicals, and heavy metals such as nickel, tin, and lead.
Nicotine—An addictive, poisonous substance that is found in all tobacco products. It creates a "high" for the user. Regular use of nicotine will result in physical withdrawal symptoms that resemble cocaine or amphetamine dependence. "Nicotine" and "nicotine use" are generally included under the umbrella terms of "tobacco" and "tobacco use" in this brief.

Brand Equity—The description of a brand's value, which is determined by consumer experiences with and their perception of a specific brand. A company’s brand has positive brand equity when people think highly of the brand and recommend others to use it.

Tobacco Use—see "nicotine."

Cessation—The fact or process of being brought to an end.

Combustible Tobacco Products—Any tobacco product that is designed to be smoked, such as cigarettes, cigars, blunts, etc.

Context

Since 2000, cigarette smoking by youth in the United States has decreased from 23% to less than 5%. This trend, however, has been offset in recent years by the surprising rise of e-cigarettes, leading to an exceptionally large increase in teen tobacco use. From 2017 to 2018, a study reported by the CDC found usage of any tobacco product increased among high school students by 38.3%, to a level of 4.9 million current tobacco product users. According to the CDC, the source of this sudden rise in youth tobacco use and subsequent nicotine addiction is an increase in e-cigarette use.

The February 2019 Morbidity and Mortality Report published by the CDC concludes that among all tobacco products used by youth (including but not limited to electronic cigarettes, cigarettes, cigars, smokeless tobacco, hookah, and pipe tobacco), the only product that increased in usage in 2018 was electronic cigarettes. The average number of high school students who used e-cigarettes in 2018 was 20.8%, a sharp increase from 11.7% of students in 2017. Total tobacco product use among high school students in 2018 was 27.1%, 77% of which was e-cigarette usage. E-cigarettes have...
become the most commonly used tobacco product among youth—ahead of cigarettes, cigars, smokeless tobacco, and so on. The growing usage of e-cigarettes in the United States contributes to higher rates of nicotine addiction among teenagers.

Contributing Factors

Marketing

Early marketing strategies used by companies producing and selling e-cigarettes as they were first introduced in the United States in 2006 were largely adult-focused, in that e-cigarettes were marketed as a "safer alternative" to conventional cigarettes and an "easier way to quit" smoking than other nicotine-cessation devices. While those tactics are still in play, more recent marketing strategies have been primarily youth-focused: in a 2016 report, the U.S. Surgeon General stated that, "E-cigarettes are marketed by . . . using a wide variety of media channels and approaches that have been used in the past for marketing conventional tobacco products to youth and young adults." In fact, 20.5 million youth (or 78.2% of middle and high school students) reported being exposed to e-cigarette advertisements from at least one source, according to the 2016 National Youth Tobacco Survey, an increase from 68.9% in 2014. Examples of this include spreading engaging posts on social media of young people and celebrities using e-cigarettes, the offering of scholarship opportunities to youth, sponsoring music festivals and events, and producing hundreds of different flavors. By using a variety of methods, e-cigarette companies have been able to influence the perceptions of young people in the United States. Over time, in seeking to "re-normalize" tobacco use, e-cigarette companies have been able to create positive brand equity for their products.
Social Media

According to the National Institute on Drug Abuse (NIDA), teens receive high exposure to e-cigarette advertising; 7 in 10 teens have reported being exposed to advertisements, most of which are retail or internet advertisements.\(^{20}\) This includes pop-up ads, ads on website pages, social media posts, and so on. Studies on the prevalence of e-cigarette advertising on social media platforms such as Instagram have concluded advertisement-themed images were most common at 29% of all e-cigarette related posts.\(^{21}\) In their efforts to appeal to youth, companies have used methods such as including pictures of celebrities or youthful models with their products. Posts and advertisements are emotionally appealing to youth because they utilize bright and colorful images as well as trendy styles.\(^{22}\) A study published by Tobacco Regulatory Science Group took a sample of over 150 e-cigarette video advertisements and measured them according to a scale of 40 youth-appealing features. The study found that every ad utilized youth-appealing emotions such as happiness, friendship, sex, or success, rather than focusing on cessation from traditional cigarettes.\(^{23}\) This finding is supported by a study published in the journal 'Pediatrics,' which concluded exposure to e-cigarette advertisement is associated with current e-cigarette use among students, and greater exposure is directly correlated to higher probability of use.\(^{24}\)

An example of a company that has specifically targeted youth in its advertising is JUUL, a company that sells e-cigarettes of the same name. A JUUL is a sleekly designed e-cigarette that looks like a USB drive. The rise in e-cigarette use during 2017-2018 is likely due to the recent popularity of these USB e-cigarettes.\(^{25}\) These products have been innovatively advertised through Twitter, Instagram, and Facebook to increase their popularity. As described earlier, JUUL's advertisements include young models and celebrities associating JUUL products with having fun, freedom, sex appeal, being cool, and so on.\(^{26}\)

In an official social media launch in 2015, the JUUL brand paid more than $1 million to market their e-cigarettes on the internet. This marketing led to an increase of USB e-cigarette related tweets from a monthly average of 755 in 2015 to more than 30,500 in 2017.\(^{27}\) A study conducted on JUUL's social media campaigns found that social media growth (on Twitter, Instagram, and such) was "highly correlated" with USB e-cigarette retail sales.\(^{28}\) JUUL is now the most commonly sold e-cigarette product in the United States and is favored among youth.


Sponsorship
Some e-cigarette companies have targeted students by offering or sponsoring scholarship opportunities to influence college hopefuls to write essays about the potential positives of using e-cigarettes. Such tactics are based on the idea that offering scholarships would increase web traffic on e-cigarette companies' sites, affiliate e-cigarette companies with universities on web searches, as well as market to young people. These scholarships, ranging from $250 to $5,000, are offered mostly as prizes for essay contests that prompt high school students to write about whether e-cigarettes could be a safer alternative to cigarettes, or about the dangers of other tobacco products. One company offered multiple scholarships of up to $1,500 on its website. By sponsoring scholarship opportunities e-cigarette companies have had their brands listed on university websites, even well-known universities like Harvard, and have found greater appeal with young people. While university students are usually not considered youth, the youth demographic is still affected by university websites as many are researching future college education opportunities.

Some e-cigarette companies have also sponsored music festivals and events. Although these marketing tactics are banned for cigarette and smokeless tobacco companies by the 1998 Master Settlement Agreement and the 2009 Family Smoking Prevention and Tobacco Control Act (put into effect due to the close association with sponsoring music, sports, and other cultural events with youth tobacco use), e-cigarette companies have been able to skirt these restrictions by claiming that their products are different than conventional cigarettes. One e-cigarette company named “Blu” sponsored a music festival in Washington in 2013, called Sasquatch! Music Festival. “Blu” hosted a vapor lounge that included an interactive social media booth, surprise guest appearances from the performers at the music festival, and samples of their products. In 2012 and 2013, free samples were handed out by 6 different e-cigarette companies at an estimated 350 events, where rates of youth participation were high. While data showing direct correlation between sponsorships and youth e-cigarette use is unavailable, studies have shown that these sponsorships and other youth-oriented marketing tactics have increased youth exposure to e-cigarettes, as evidenced by the past correlation with similar sponsorships and youth cigarette use.

**Variety of Flavors**

The multitude of different flavors of e-cigarettes has specific appeal to youth. Marketed as one of the biggest and most appealing differences between e-cigarettes and cigarettes, hundreds of different flavors of e-juice are available. Whether in a separate e-juice cartridge or a pre-filled e-cigarette,
products can be found in almost any flavor. A recent study, as reported by the Campaign for Tobacco Free Kids, found there are over 15,500 unique flavors of e-cigarettes, a majority of which are either fruit, dessert, or candy flavored. Examples include “crispy churro,” “green apple tango,” “mango madness,” and “blueberry cotton candy.” Health officials have accused e-cigarette manufacturers of targeting youth with flavors like bubble gum and cotton candy, while other organizations have condemned JUUL for continuing to sell one of its most popular flavors with youth: mint. The FDA’s 2013-2014 Population Assessment of Tobacco and Health (PATH) Survey reported that of all youth aged 12-17 who had ever used an e-cigarette or similar product, 81% had used a flavored product. Of all current youth users, the survey purported that 85.3% had used a flavored e-cigarette in the past month. When asked why they use e-cigarettes, 81.5% of current youth e-cigarette users reported they did so “because they come in flavors I like.” The results of this study, as well as that of others, indicate that flavor selection has influenced many young people to take up e-cigarette use.

Lack of Education

An overall lack of education regarding the content and health risks of e-cigarettes is a potential contributing factor to the rise of youth usage of the product. Some studies back up the claims that e-cigarettes are a “safer alternative” to smoking, suggesting e-cigarettes might be less harmful than cigarettes when people who regularly smoke switch to them as a complete replacement. For example, a recent study done in the UK found e-cigarettes to be “95% safer than conventional cigarettes.” Though credible sources later discounted this study, stating that it was conducted based on opinion instead of evidence, people may remember the incorrect study and think it is truth. While scientists and researchers continue to study the effects of e-cigarettes, much of the public, including youth, are unaware of the potential consequences, contributing to an increasing number of underage drug use.

Due to e-cigarettes being relatively new to the market, studies conducted about e-cigarettes are still slow to reach the public eye. Since they were introduced into the United States in 2006-2007, multiple studies have been done on the various health effects of e-cigarettes. A study published in the journal “Tobacco
Control" found that 63% of USB e-cigarette users between ages 15-24 did not know the product contains nicotine. Another study, conducted by NIDA, found that 66% of teen users of e-cigarettes thought the content was "just flavoring," and 13% reported they did not know what was in their e-cigarettes. A similar study conducted in Connecticut found over 33% of adolescents were unaware of the nicotine concentration in their e-liquid. Concerningly, these statistics could prove that many adolescents are unknowingly being exposed to high concentrations of nicotine.

Peer Pressure and Family Culture

While marketing tactics and a lack of overall education on the subject have undoubtedly contributed to the national rise in youth e-cigarette usage, the importance of peer pressure and family culture in influencing usage must also be considered. Peer pressure among students in middle and high schools has contributed to the rise of usage of specific products such as USB e-cigarettes. These products are easily hidden in pockets or backpacks, and are increasingly used by youth in schools, including inside bathrooms and even classrooms. According to a counselor at a correctional high school, a culture of e-cigarettes usage has arisen among youth. Just as students try to impress their friends with cool shoes or backpacks, e-cigarettes have become symbols of popularity and status. Trying out each other's flavors of aerosol has become increasingly popular, especially as JUUL usage has increased. Because using USB e-cigarettes has become a "cool" thing for youth to do, peer pressure has led many to start vaping.

The National Youth Tobacco Survey conducted in 2016 found that for students who reported using e-cigarettes that year, 39% stated their reason for starting to use was "use by a friend or family member." In other words, over a third of high school students claimed they started to use e-cigarettes because someone in their family or friend group did. This shows how tobacco product usage in a home is strongly related to a child starting use of e-cigarettes. Studies conducted on the influence of parent tobacco use on adolescents show that adolescents are much more likely to smoke if their parents do. It can thus be reasonably assumed that growing up in a home where e-cigarettes and other tobacco products are used increases a youth's likelihood of starting e-cigarette use. When youth are frequently exposed to e-cigarettes and other tobacco products in the home, they are at greater risk of becoming addicted to nicotine and other drugs.

Consequences

Health Effects
While e-cigarettes have often been marketed as "safe," there are many potential health detriments to using e-cigarettes, especially for youth. Positive health effects to using e-cigarettes as a cessation tool for adult cigarette smokers also potentially exist, although the FDA has clearly stated that e-cigarettes are not an approved method of tobacco cessation. However, as youth e-cigarette usage has risen in recent years, the potential of negative health effects of e-cigarettes has become more apparent. Youth are particularly vulnerable because their brains are still in the process of developing. Potential health effects of e-cigarette usage arise from nicotine addiction, inhalation of many dangerous chemicals, and further drug abuse. However due to the newness of e-cigarette products, the long-term health consequences are still largely unknown.

Nicotine Addiction

Most e-cigarettes contain nicotine at varying levels, and some popular brands have an even higher nicotine content than regular cigarettes. For example, JUUL pods (replaceable e-juice cartridges) contain the same nicotine level as a pack of 20 cigarettes.

The Director of the CDC, Robert R. Redfield, M.D. stated, "The skyrocketing growth of young people's e-cigarette use over the past year threatens to erase progress made in reducing youth tobacco use. It is putting a new generation at risk for nicotine addiction." Nicotine can have negative health effects on adolescent brains. Development of cognitive regions such as the prefrontal cortex continues through adolescence and into the 20's. Adolescent nicotine exposure through cigarette smoking is related to lasting cognitive and behavioral impairments, such as negatively affecting the working memory and attention capacity and reducing prefrontal cortex activation. In other words, youth who use nicotine are especially likely to suffer detriments to brain circuits that control attention and learning, potentially inhibiting their learning abilities at school. Other potential risks include mood disorders as well as permanent problems with impulse control, defined as a failure to fight urges or impulses that could harm oneself or others. Detrimental effects to brain development will linger with a youth through adulthood, potentially posing long-term health defects.
Inhalation of Dangerous Chemicals

The aerosol created by the vaporization of "e-juice" contains many potentially harmful chemicals, including but not limited to nicotine. The aerosol contents are not only inhaled by the user of the e-cigarette, but also by bystanders. Compounds commonly found in "e-juice" contain many potentially harmful chemicals such as formaldehyde, acrolein, volatile organic compounds like toluene, metals like nickel and lead, and other carcinogenic organic compounds. It should be noted that these compounds are found in much lower levels in e-cigarettes than in regular cigarettes, which has reinforced the argument that e-cigarettes are a safer alternative to cigarettes. While the long-term health effects of inhaling these chemicals are still being researched due to the newness of the product, any inhalation or exposure to these compounds at any level is detrimental to respiratory health, especially that of the developing adolescent.  

Alternatively, some of the e-cigarette flavors have been shown in a report by the Surgeon General to cause a serious lung disease called bronchitis obliterans, nicknamed "popcorn lung." Bronchitis obliterans is an illness that obstructs the small airways of the lungs that leads to a progressive decline in lung function and has no cure. The disease was first discovered among workers at a popcorn factory who were exposed to the chemical diacetyl from popcorn flavoring. Diacetyl is a common chemical compound found in many e-cigarette juice flavorings. Chemical compounds in the aerosol, as well as chemicals in the flavor, have the potential to cause serious respiratory damage when inhaled deep into the lungs.

A recent study conducted by the Stanford University Medical Center found that the various chemicals in e-juice liquids or flavorings increase the risk of heart disease. Various flavors were tested on laboratory cells, with cinnamon and menthol flavors showing the most risk to damaging blood cells. E-cigarette chemicals and liquids are also potentially linked to blood disease. A separate study produced by the University of Rochester Medical Center reported damage to certain white blood cells when exposed to chemicals generally found in e-cigarettes. The most toxic flavors to white blood cells were cinnamon, vanilla, and buttery flavors. Further research on the potential of heart and blood disease in e-cigarette users is still pending; however, early results such as this study show strong correlation between e-cigarette usage and such diseases.

Drug Abuse

A significant concern about adolescent usage of e-cigarettes is the probability that it could lead to future use of combustible tobacco products. As an addictive substance nicotine affects the development of the brain's reward system. Thus, prolonged e-cigarette use will not only lead to nicotine addiction, but may also lead to the use of other drugs such as cocaine and methamphetamine. Further drug use can become more appealing to an adolescent's developing brain following frequent e-cigarette use. Continuing research must be done to effectively understand whether e-cigarette use directly influences an adolescent to take up other, harder drugs.
Youth-focused surveys have found that adolescents who had used e-cigarettes by the time they started 9th grade were more likely than others to start smoking cigarettes and other smokeable tobacco products within the next year. For example, studies reported by the NIDA evaluated whether e-cigarette use among adolescents is associated with the initiation of combustible tobacco products. One study was conducted among 10 public high schools in Los Angeles, California, with a total of over 2,500 students involved. The report stated that among these students, those who had used e-cigarettes were more likely to report initiation of combustible tobacco use over the next year as compared with those who had never used e-cigarettes. Another study conducted among public high schools in Connecticut, and published in Pediatrics in January of 2018, found similar results. It concluded that of teens who use e-cigarettes, 30% will start smoking within 6 months, as compared to 8% of non-users who will do the same. In other words, this study claims that youth who use e-cigarettes are almost 4 times more likely to start smoking cigarettes.

Practices

Anti-Tobacco or E-Cigarette Advertisement Campaign

Just as e-cigarette and tobacco companies are using youth-focused marketing techniques such as posting on social media, sponsoring music festivals, and putting advertisements on television, anti-tobacco or e-cigarette advertisement campaigns are being implemented as an intervention to counter that marketing. Specifically, with the rise of e-cigarette usage, campaigns to counter the techniques used by e-cigarette companies are catching the attention of youth across the United States. One example of an advertisement campaign is called Truth, which is run by The Truth Initiative, a large nonprofit public health organization. This campaign focuses on encouraging youth to not even start using e-cigarettes rather than focusing on cessation from those products. Anti-e-cigarette marketing programs are found across all social media platforms. By using recognizable branding as well as focusing on youth emotions such as humor and making popular posts involving youth and celebrities, the Truth campaign targets youth across the nation and conveys facts about the health effects and social consequences of tobacco use.
festivals have also been used by campaigns to more effectively reach out to youth and inform them of the negative consequences of tobacco and e-cigarette use.\textsuperscript{68}

\textbf{Impact}

There is a high amount of anti-e-cigarette advertisement awareness among adolescents and young adults.\textsuperscript{70} Effective branding techniques have increased the impact of anti-e-cigarette marketing programs. Programs report outputs such as number of youth reached, number of views on their social media pages, etc. The impact of branding techniques has been measured by a study published in the "International Journal of Environmental Research and Public Health." This study found that respondents who reported positive brand equity with the Truth campaign were less likely to have reported smoking in the past 30 days, as surveyed 12 months later. These findings have been used to make a population estimate of around 300,000 youth and young adults who have been prevented from smoking.\textsuperscript{71} Studies on the effectiveness and impact of branding have yet to be completed; however, there is a high likelihood that anti-e-cigarette campaigns can also be effective practices in influencing youth usage based on the effectiveness of current pro-e-cigarette campaigns.

\textbf{Gaps}

Anti-e-cigarette advertisement campaigns might fall short in teaching youth the reasons why using e-cigarettes are harmful. Effective programs can influence the brand equity of e-cigarette companies among youth, but there is uncertainty whether their level of education will change. Additionally, the effectiveness of teaching and spreading information to adolescents about the dangers of e-cigarettes through social media campaigns and other marketing programs such as sponsoring music festivals needs to be measured in order to understand the long-term impact of these campaigns. To achieve long-term impact, campaigns must convey an efficacious message, be clear, and involve youth spokespeople; without clear-cut messages or a focus on a single message, campaigns will fail in achieving real impact in the lives of youth.\textsuperscript{72} Long-term impact involves not only helping adolescents recognize a brand that tells them to not use e-cigarettes, but involves informing youth about the dangers of e-cigarettes through marketing campaigns, the impact of which remains to be seen due to how recently e-cigarettes have been introduced into the United States.

\textbf{Digital Tobacco Cessation Program}
Another teen-focused practice aimed at reducing e-cigarette usage among youth involves using technology—something that most adolescents in the United States can relate well with. Digital tobacco cessation programs focus on youth who are already using e-cigarettes and gives resources and encouragement to help them quit using those products, as well as help them recover from nicotine addiction. An example of a digital tobacco cessation program is "BecomeAnEx." Created by The Truth Initiative in collaboration with the Mayo Clinic and offered through either simple text messages or online help videos and resources, the BecomeAnEx program has recently added e-cigarette programs to encourage youth to reach out for help by providing them real-time responses to their questions and concerns, as well as providing daily motivation to quit. Teens can sign up for free to receive periodic text messages of encouragement and advice on their phone.

Impact

BecomeAnEx has only recently been tailored to incorporate e-cigarettes into its tobacco-cessation aid program. While research on the impact of this specific program in helping adolescent e-cigarette users to quit has not yet been reported, past research on the impact of this program in assisting cigarette users to quit is informative. According to the BecomeAnEx website, research that has been conducted shows that following the BecomeAnEx quit plan "quadruples a tobacco user's chance of quitting." Such programs have assisted thousands of people in their journey of quitting tobacco use. It can reasonably be assumed that there will be a similar impact with e-cigarettes; however, because e-cigarettes are inherently different than cigarettes in levels of nicotine and how they are marketed, the actual impact remains unknown. One part of the current digital tobacco cessation program has been proven to be impactful—text coaching. It is a proven and powerful strategy in boosting success and delivering behavior change. More study must be conducted on the effectiveness of text coaching on youth who are using e-cigarettes and how it affects their desire to quit.

Gaps

This practice seems to have great potential in utilizing technology to help empower youth who want to quit with the resources and motivation to do so. However, the inclusion of e-cigarettes to the BecomeAnEx quit program is so new that impact either cannot be measured or has not yet been reported. That being said, based on past successes with helping tobacco users quit, there is a high likelihood it will have a positive impact among youth e-cigarette users. At this point, many adolescents who use e-cigarettes might not know exactly why it is important to stop. This program's success requires marketing in a way that helps youth understand the benefits of quitting e-cigarettes so they can be self-motivated to participate in the program and quit e-cigarette use. Such motivation will be essential in order for youth to read, value, and internalize the messages sent by BecomeAnEx. Self-motivation has proven to be key based on past cigarette cessation methods in helping users begin the cessation program and successfully quit.
This practice is aimed at helping to change the cultural norms surrounding e-cigarette usage by helping youth better understand the harmful effects of e-cigarettes. In order to help youth better understand the harms of nicotine use, this practice encourages youth to teach their peers. Special events are held throughout the year where thousands of youth are invited to participate and learn about the dangers of tobacco use, training programs are conducted for youth advocates so they can go back to their communities and empower other youth, and like-minded youth across the nation are united in efforts to educate about e-cigarettes. These practices help youth take the initiative. An organized national movement to engineer social change in youth culture is leading to an increased number of adolescents becoming more informed and more passionate about the issue.

**Impact**

This intervention seems to have a positive impact among youth in the United States, as they feature fun events like festivals and parties, as well as other activities and incentives to engage youth and keep them excited about the issue. Outwardly, these programs look to be working well. However, reports focus on outputs instead of outcomes of the intervention. Research conducted on these campaigns has found positive reaction to them, especially with regards to positive brand equity. Just as youth have associated JUUL with fun and pleasure, youth are beginning to associate the Truth program similarly. However, because this campaign is so comprehensive and spread throughout the nation, it is difficult to fully comprehend the impact.

**Gaps**

Campaigns publish all that they have done to engage youth, but the effect is less widely known. This lack of Impact could be due to the difficulty of measuring how much one empowered youth does in engaging other youth against e-cigarette use. As stated earlier, reports on this program focus on outputs instead of outcomes. It is unclear what the true effect of this program is on youth e-cigarette use, although logically it might make sense. Actual impact must be measured in some way, possibly through surveys given to youth who participate in the program to better understand their influence on their peers.

**Advocate for Open Communication in the Home**

As companies and organizations continue to research and discover the true effects of e-cigarettes, one basic but crucial intervention advocated by the CDC is open communication in the home. This practice focuses on helping families in the United States have a culture of avoiding tobacco use by empowering parents to better inform their children about the dangers of tobacco use. Parents are more likely to become aware of new information regarding the dangers of e-cigarette use among adolescents than their children are. This important intervention emphasizes the need for parents to talk with their teen about e-cigarettes. Because a parent’s example has a large impact on a child’s development, the CDC encourages parents to set a good example of a tobacco-free lifestyle while also taking time to discuss with their child the true
dangers of tobacco use and the potential harms of e-cigarettes. To do so, a parent must be well-informed of the issue and be able to answer their child's questions if they have any. To help parents be well-informed, the CDC created a website called "Talk with Your Teen About E-Cigarettes: A Tip Sheet for Parents," which provides parents with informational articles, videos, and data to help them fully comprehend e-cigarette usage by adolescents, as far as has been researched. By advocating for open communication in the home, the CDC is empowering parents to teach their children the dangers of using tobacco products and encouraging all to live tobacco-free lives.

**Impact**

E-cigarettes have been introduced into the U.S. market so recently that the effects of countermeasures are still being researched. However, the impact of a parent's example and teachings on children has been researched dutifully over time, showing a positive correlation. This program is creating positive impact by informing parents about the issue and advocating for them to speak with their children. Complacency and lack of communication between children and parents can easily lead to more e-cigarette use by teenagers. However, because research is lacking on e-cigarette usage prevention specifically, the effectiveness of this program on empowering parents has yet to be seen. Again, based on experience, other interventions to empower parents—with focuses such as cigarettes, pornography, and education—have had positive results. In the future, the effectiveness of this program will most likely be made more apparent.

**Gaps**

Possible gaps in this intervention lie in teens' receptivity to their parent's discussions and teachings. As explained by the theory of psychological reactance, youth might react negatively to their parents' intervention if they feel their freedom is being infringed upon. Also, because social media has spread misinformation to youth all over the country, many youths might lean towards what they learn from social media or their friends over what they hear from their parents. E-cigarette companies have effectively targeted youth by using social media and other marketing tactics, as well as influencing the youth culture to make e-cigarette use, or "vaping" seem cool. To change this perception, this program must understand that a young person's psychological reactance to their parents must be gradually overcome for them to learn to choose to avoid or quit e-cigarette use.

North America
Cade Hyde

Cade is an undergraduate student who has extensive experience with this particular issue. In high school, he founded Students Against Electronic Vaping (SAEV), which is now a registered non-profit. SAEV’s goal is to eradicate youth e-cigarette use in the state of Utah. Through his leadership of SAEV, Cade has gained experience with giving media presentations, lobbying legislators, and organizing grassroots movements. By researching and writing about youth vaping, Cade has felt empowered to better tackle this epidemic.

Substance Abuse Among College Students in the United States

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