Up In Smoke: Teenage Habits and Consequences

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Public Health - DEN 2413

1 February 2023

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Introduction

The e-cigarette industry's success can be attributed to a number of factors; including the public's perception that e-cigarettes are a safer alternative to traditional tobacco products[8], the availability of Do-It-Yourself instructions, starter kits on social media platforms, and the industry's strategy to target younger age groups.[4] In recent years, traditional cigarette smoking has fallen behind the use of e-cigarettes among middle- and high-school students in the United States. Additionally, the various flavors including tobacco and menthol, a wide variety of candy, beverage, and fruit flavors are available in e-liquids that cater to these young consumers. All of these factors have shown that using an electronic cigarette can encourage people who have never smoked to do so; such as teenagers.[4]

Despite the vast variety of e-liquids available, the three main components of e-liquids—base, nicotine, and flavors—are generally understood. E-liquids, especially those made of glycerin, have a high viscosity that serves as the base for most e-liquids. Aerosols from these e-liquids frequently form and readily adhere to exposed surfaces. The lungs, epiglottis, larynx, and soft and hard tissues in the mouth, nose, and throat are directly adhered to by these aerosols; they also inadvertently cling to the clothes, skin, hair, and interior living spaces. Many factors make the interaction of the viscous aerosol with the oral cavity quite interesting, especially for dental professionals.[8] Furthermore, the first organ to interact directly with e-cigarette vapor is the oral cavity, which includes the lips, gingiva, teeth, palate, and tongue.[3] It has been demonstrated that numerous e-liquids are chemically and physically comparable to sweet and gelatinous foods, which are significant risk factors for dental caries.[3] In this paper, we will show that teens who use electronic cigarettes are more likely to have problems with their oral health as they get older.

Assessment

Our target population includes the 7th grade class at St. Nicholas of Tolentine Catholic Academy located in Jamaica, Queens. Despite its small geographical size, according to 2021 Census data, Jamaica, Queens is home to a population of approximately 270,000 people, 14% of whom are between the ages of 10 and 19. According to the 2021 Census Report, the median household income in Jamaica is $68,682, with 36% of the population with a household income below $50,000 and 18% of youth being classified as living in poverty.

The age of particular interest for our project is 12-13 years. This stage of life is one that undergoes profound transformation. Habits and influences that occur during one's youth, whether positive or negative, can translate into adulthood. According to the CDC, 90% of adults who smoke initially adopted the habit in adolescence. This age group is also most susceptible to smoking-related messages from the media, their friends, and their parents. Youth smoking behaviors have also been linked to lower socioeconomic status (SES), a lack of parental involvement, low self-esteem, and ease of accessibility. Lower SES is especially concerning for the target demographic of our presentation since 18% of residents of Jamaica (Queens) under the age of 18 live below the poverty line. Moreover, the adolescent years of a person's life are further hampered by growing self-awareness, bullying, an unhealthy diet consisting of acidic and sugary foods, as well as the false impression of invincibility. At the age of 12-13, the canines, second premolars, and second molars of the maxilla, and the first premolars, second premolars, and second molars of the mandible are all potentially not yet completely erupted. After eruption is complete, the post-eruptive maturation process is still taking place over the following two years. All of these supplementary factors combined make this a critical time for oral health. Our group

utilized a written survey to evaluate the group's prior knowledge on vaping before the presentation.

Planning

Our main goal was to raise awareness to these students about the dangers of vaping and how vaping can harm oral health. To deliver optimal learning objectives with middle school-aged (12-13 years old) students, the Service Learning Project must be enjoyable, entertaining, and unbiased. Therefore, considering our target population's age and education level, the project must be clear and understandable. With each passing year, the age of the youngest vaping users appears to be dropping due to society and easy access.

Our lesson plan includes: an icebreaker, educational instruction, and home care review. The icebreaker will be the first step to get the students' attention by assessing their knowledge of vaping products, and if they know anyone who uses them. After having the students answer the short questionnaire, we will ask the students if they know about the dangerous effects that e-cigarette usage does on our bodies and oral health. Next will be the direct education about vaping and how that can be related to oral hygiene, which will help students better understand the relationship between oral health and the risks that come with e-cigarette usage. Third, using all the knowledge we have shared with the students, we will play Jeopardy as a fun educational activity—which will include a prize—to engage with the students. Lastly, after reviewing proper home care habits, we will have them fill out a survey questionnaire on how we can prevent teens from vaping and how to maintain good oral hygiene. As a result of our project, one of our objectives is to have 70% of the students who are currently using e-cigarettes to stop vaping, and 80% be able to exhibit effective brushing and flossing techniques.

Implementation

The manner in which we planned on implementing our course was structured in four parts. Based on the parameters of our target demographic, we believed this was the best way to educate our target audience and made sure that they retained the information that has been presented to them. The initial icebreaker made the students become acclimated with the subject matter and as a result, they were able to see the connection between e-cigarettes and themselves. Once this relationship was established, the students then learned factual knowledge pertaining to e-cigarettes—the effects that they have on the body and in particular the oral cavity. This took place during direct educational instruction where the students were fully engaged with the subject and as a result, began to learn comprehensively about e-cigarettes.

In order to make sure the information was received and comprehended properly, the students then participated in an interactive game of Jeopardy pertaining to the lesson that was conducted. The game was used to ascertain if the students grasped the information while also giving the students an incentive to retain what they have learned. The last step of our presentation—the questionnaire—served as a self-reflection for our target demographic in order for them to be more proactive in understanding the subject matter and as a result be able to disseminate the information they learned to their peers and the overall community.

Evaluation

Our main measurable objective was recorded through pre- and post-instructional assessments. Prior to our presentation, we evaluated the students' knowledge and views on vaping by having them do a pre-instructional assessment. After the presentation, we had the students complete a post-instructional assessment to record data and assess their new understanding on the effects of vaping.

As recorded in the pre-instructional assessments, 95% of the students responded that they knew what e-cigarettes and vapes are. 52% of the students either uses or knows someone that uses e-cigarettes. 100% of the students knew about the health damages caused by e-cigarettes. 63% of the students knew about the damages specific to oral health caused by e-cigarettes. 89% of the students knew about other ways how vaping can affect their lives. 79% of the students were open to quitting or helping others quit vaping.

After the presentation, all students responded that they felt more informed about vaping. All students were also specifically more aware of the different risks associated with e-cigarettes and were more likely to quit or not start using e-cigarettes. 85% of the students were more comfortable starting a conversation about quitting vaping with others that use e-cigarettes. These results reflect an increase in the students' understanding of vaping and its effects.

The class was also very engaged during the Jeopardy game, Q&A, and oral hygiene demonstration. There were a total of 12 Jeopardy questions of which 83% were answered correctly on the first attempt. The remaining 17% were answered correctly on the second attempt. Both the students and the teachers responded positively to the general oral hygiene demonstration which included the Modified Bass Method toothbrushing and proper flossing.

Conclusion

Furthermore, our group aimed to raise awareness to the youth on the potential consequences of vaping on oral health. The components of vaping include glycerin, nicotine, and flavorings which generate a viscous and dense substance comparable to sticky cariogenic food.[3]Additionally, nicotine is a highly addictive ingredient that has demonstrated adverse effects, especially on the growing brain. Moreover, nicotine can have detrimental effects on brain development; which does not fully conclude until a person is about 25 years old. Also, nicotine affects areas of the brain that regulates attention, learning, emotion, and decision-making.[2] And with nicotine present in e-cigarettes, the risk of high blood pressure and diabetes are significantly increased.[6] Studies also demonstrate that due to the high temperature of the e-cigarette's mouthpiece, it can induce direct burns to the oral mucosa.

Additionally, the inhaled aerosol may possibly cause yellow tooth discoloration.[10] Further, when exposed to e-cigarette aerosols, the opportunistic bacteria in the oral cavity increases resulting in dry mouth and irritated gums. Moreover, the sweet flavorings found in these e-cigarettes contribute to caries development; and one may even develop chronic lung diseases.[10] Thus, the known and unknown concoctions found in e-liquids are potentially cariogenic and can cause harm to the user's overall health, periodontal health, and may also progress to developing carious lesions. Therefore, it is significant that dental healthcare professionals are made aware of the possible risks associated with vaping through a thorough medical-dental history review with the patient; take steps to educate their patients who use e-cigarettes; and offer encouragement and support to help quit e-cigarette usage.

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