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ELECTRONIC CIGARETTES AND VAPING: KNOW THE FACTS

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HONORS PROJECT

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ABSTRACT

There is a new wave of products introducing addiction to the young adult generation. Electronic cigarettes, both nicotine and THC containing, are a rising trend in the younger generations, including middle school, high school, and college aged students. With such a large amount of youth using these products, it is alarming how little is known about the consequences of these devices and how little the population cares about learning what is being inhaled into their bodies. That is why this project focused on creating a method which relays important information about electronic cigarettes in a compact and coherent way through the creation of a flyer. The intended target population focused on within this article is college aged persons and younger generations, ideally ages 12-28. While this flyer could be distributed to all ages, this report focuses on college-aged persons (17-28). The following article will include a basic background about electronic cigarettes, both nicotine and THC versions, followed by an evaluation on why college aged students should discover this knowledge. Then the general outline of the process of the project is highlighted, followed by an explanation of why a flyer was chosen and detailing each section chosen within the flyer. Finally, the article ends with what the project is intended to achieve, and what the future of electronic cigarettes will hopefully become.

Keywords: College aged students, Electronic cigarettes, Addiction, Nicotine, THC

INTRODUCTION

A new wave of addictive devices has surfaced and ensnared a younger generation. These devices can contain both nicotine and THC. While several users are convinced of the safety of these products, some users may have learned of the dangers yet choose to use these devices anyways. The majority of college aged students picked this habit up without ever smoking or chose electronic cigarettes over traditional smoking products because they believed the practice was safer (Adams et al., 2020). However, there is little research known about these devices and the negative consequences they can bring. Also, there is a general lack of knowledge about the devices among the young adult population. According to the website, “Know the Risks,” 6 out of every 10 teens believe occasional use of e-cigarettes causes only little harm. For this reason, this project focused on creating a way to capture the attention of the young adult population in a simple but informative way to alert people to a few important facts about electronic cigarettes and vaping devices.

BASIC BACKGROUND

There are two main electronic cigarettes focused on within this article, the first being products containing nicotine, and the second being products containing tetrahydrocannabinol (THC). While both are dangerous in their own regard, the consequences written about throughout the article can be generally applied to both products. This section of the article provides a background and specific details about each type of product separately in order to provide readers a chance to examine the specific device they are using or curious about.

I. Electronic Cigarettes (nicotine)

Electronic cigarettes go by several names, including “hookahs,” “electronic nicotine delivery systems” (ENDS), and “mods” (CDC, 2020a). Most electronic cigarettes contain a

battery, atomizer, cartridge, and mouthpiece. The battery powers the device, the atomizer heats the e-liquid into an aerosol, the cartridge contains the e-liquid, and the mouthpiece is where a user inhales. Electronic cigarettes were originally intended to benefit adult smokers and provide a substitute for regular cigarettes (CDC, 2020b). In general, electronic cigarettes are safer than regular cigarettes because they contain fewer chemicals than the 7,000 chemicals in regular cigarettes (CDC, 2020b). However, electronic cigarettes are not harmless, and can cause nicotine addiction and other unintended consequences.

As stated, these devices' original intent was to help smokers have a substitute for regular cigarettes. Unfortunately, the primary users of these products are younger generations such as middle school, high school, and college aged persons. According to the Centers for Disease Control and Prevention (2020), in 2017, 2.8% of U.S adults were electronic cigarette users, whereas 4.9% of middle school students and 20.8% of high school students were users. Also, some e-cigarettes are flavored to taste like mango, bubblegum, or other fruity flavors, further appealing to younger generations. While the FDA has banned most fruity flavors from being produced, younger generations continue to be the top users of these devices. Nicotine containing electronic cigarettes are not harmless, and their specific health risks will be discussed later on in the article.

II. Electronic Cigarettes (THC)

Electronic cigarettes which contain THC are most commonly called “vape pens,” “mods,” “dab pens,” or “vapes.” Vape pens are usually composed in the same way as nicotine electronic cigarettes, with a battery, mouthpiece, cartridge, and heating component (aerosol). The main difference is the cannabis-infused oils in place of the e-liquid within nicotine electronic cigarettes (Richter, 2018). According to the Center of New York Living, (2018), there are vape

pens for dry herbs where marijuana will be put into the chamber and then turned into vapor.

There are also vape pens for waxes/dabs which uses concentrated doses of THC to create a sticky oil known as “wax.” The waxes usually contain up to 90% THC concentration, whereas regular marijuana usually only has 20%. Finally, vape pens can use cartridges which come with pre-filled THC concentrates (*Is Vaping Marijuana Safe?*). These three forms of a vape pen are the most commonly used forms of THC containing electronic cigarettes.

While THC has not been shown to be seriously addictive, there are still several health risks these “vape pens” have been associated with. THC electronic cigarettes can contain several harmful chemicals, such as vitamin E acetate and ammonia, which can cause serious lung problems and central nervous system issues (*Is Vaping Marijuana Safe?* New York Center for Living, 2018). These devices can also aggravate asthma and can interfere with normal brain functioning, leading to impaired memory and thinking capabilities. While THC containing electronic cigarettes have not been proven to be outwardly addictive, this does not mean the devices are without harm. Knowing what is being inhaled into the body and learning about the potential health risks is crucial to help inform younger generations about what they are using and why they should not be using these products.

EXPLANATION OF IMPORTANCE OF ELECTRONIC CIGARETTE KNOWLEDGE

TO COLLEGE STUDENTS

Expanding the knowledge of electronic cigarettes to the general public is a necessity. However, expanding the knowledge of college aged students and younger generations about the health effects of electronic cigarettes is especially important. Electronic cigarette usage has been increasing amongst college students, and most students do not know the risks associated with usage (Adams et al., 2020). One consequential risk would be the harm to a developing brain.

Younger generations and college aged students' brains are still developing, and their brains are in jeopardy of higher addiction rates, behavior issues, and use of other tobacco/drug products (Adams et al., 2020). Unfortunately, a great deal of students do not associate risks with these products, and therefore have no idea of the consequences the products bring.

From a college student's perspective such as myself, the use of electronic cigarettes seems to largely be a trend. Most students use these devices due to their friends using, or the social factor, or the fear of not being "cool." Students did not start in order to become addicted to nicotine, nor did they fully know what they were inhaling into their bodies. I strongly believe if younger generations are informed of the health risks and consequences these devices impose, there will be decreased usage overall. There is a theory known as the "social norms theory" which tries to understand the environment and interpersonal influences in order to change behavior. This theory states the correcting misperceptions of perceived norms will most likely result in a decrease in the problem behavior (Dempsey et al., 2018). Oftentimes, the interventions used in a social norms theory are social media campaigns which use electronic and print media to promote accurate and healthy norms about a certain health behavior. The goal of the social norm's theory is to properly educate the public about misperceptions of a certain health behavior. As previously stated, most students may use these devices due to their peers using and not knowing how harmful these devices can be. But according to the social norm's theory, if a student were to read the flyer which contains facts about the dangers of electronic cigarettes, the student's misperceptions would be corrected, and they may attempt to correct this problem behavior. In turn, if less students are using, the general peer pressure of using the devices will decrease, because less and less people will be using overall. The flyer is a small way to inform

students of a few key facts about electronic cigarettes, and to hopefully inspire students to seek more knowledge about the products.

WHY A FLYER?

Throughout this project several different ideas were thrown around as to what would best appeal to the college-aged population. Initially, three different informative formats were going to be created with each oriented towards a specific age group. First, a children's book which was informative and cheery, but detailed the negative consequences of smoking electronic cigarettes. Second, a flyer for middle-school and high-school aged students to read through while in the bathroom or at a bulletin board around school. Finally, a laptop sticker was going to be created for college aged students which would contain a link to a literature review I conducted concerning electronic cigarettes and their negative consequences.

As the project process continued, I recognized doing all three ideas would require an extraordinary amount of time and effort. Initially, I was focused solely on the laptop sticker containing the link to a literature review I conducted. However, as my advisor, Ms. Hartzog, and I discussed, we realized not many college aged students would open up a link to a long paper and actually read the contents. Due to this, I ultimately decided to create a flyer oriented towards college-aged students. In general, I believed more students were likely to read over a flyer rather than a long paper, and even if they only read one aspect of the flyer, this would be more information than ignoring a paper altogether. Overall, a flyer seemed the best method to get across a few main facts I would like to relay to my target population. By using large fonts, bright colors, and a creative format, the flyer will draw people's eyes towards its contents, and hopefully enlighten a few people of the dangers of smoking electronic cigarettes.

COMPONENT ONE OF FLYER

The first component of the flyer concerns the number of deaths and hospitalization cases in correlation with electronic cigarette and vaping usage. According to the Centers for Disease Control and Prevention (2020), a total of 2,807 hospitalized e-cigarette/vaping associated lung injury cases or deaths have been reported. Among 2,668 of these cases, 66% of victims were male and the median age was 24. Among 2,022 cases, 82% reported using THC-containing products, and 57% reported using nicotine-containing products (CDC, 2020c). These statistics all come from the Centers for Disease Control and Prevention and highlight why this was a crucial component to include in the flyer.

Gaining the attention of college aged students can be difficult but highlighting the fact that there have been deaths and hospitalization cases stemming from electronic cigarettes is definitely raising awareness about the potential dangers of vaping. Students do not seem to take these products as serious health risks. They have not done the research and believe they are inhaling simply “water vapor” and cannot be harmed by these devices. Showing college students the factual data about deaths and hospitalizations will hopefully bring a realization about the dangers these products possess. Hopefully reading those facts on the flyer will correct any misperceptions these students have. As discussed above, in the social norm’s theory, if a student’s misperceptions are corrected, the problem behavior should decrease (Dempsey et al., 2018)

COMPONENT TWO OF FLYER

The second component of the flyer concerns the chemical compositions of electronic cigarettes. In general, college students tend to have no idea what they are actually inhaling into their bodies (Hart et al., 2017). Most believe the devices contain only water vapor with small

amounts of nicotine and THC. However, these devices contain far more than that, both nicotine and THC versions of an electronic cigarette.

According to the website, Know the Risks (2020), nicotine e-cigarettes can contain several harmful components, such as ultrafine particles which can scratch the lungs, diacetyl, heavy metals, and volatile organic compounds. The additive contained in several electronic cigarettes, diacetyl, has been associated with a disease known as “popcorn lungs” which causes scarring of the tiny air sacs of the lungs and results in thickening and narrowed airways. Popcorn lungs can have several negative health effects, such as shortness of breath, wheezing, and coughing (American Lung Association, 2016). In general, nicotine electronic cigarettes are far more than just nicotine and water vapor; they can contain several harmful components which can pose a serious health risk to younger generations.

Continuing on from nicotine devices, THC devices also contain more than just THC and water vapor. Some THC devices can contain a vitamin E acetate additive (CDC, 2020c). Vitamin E acetate can normally be found in some of the foods we eat, such as vegetable oils and green leafy vegetables. However, when added into a vaping product, vitamin E must be heated up in order to achieve a vapor form. The heating of vitamin E turns the oily chemical into a sticky substance which can stick to the user’s lungs causing symptoms similar to bronchitis (Boudi et al., 2019). Once the sticky vitamin E attaches to the lungs, the substance can interfere with the lungs surfactant levels and inhibit lung expansion and stability (Boudi et al., 2019). While there are other chemicals added to vaping devices, the most researched is vitamin E acetate. This additive has become an increasing cause of hospitalization and death cases concerning THC devices, and most users are unaware the substance is present in their product. Hopefully if more

users are aware of what they are inhaling and the harm these additives can cause, they will hesitate before using again.

COMPONENT THREE OF FLYER

Component three of the flyer concerns the potential harm to the developing brain of adolescents and how they could become more prone to addiction due to these devices. The brain does not fully develop until around 25 years of age, so college students and younger generations are at risk of harming this development if they use electronic cigarettes. If a developing brain is exposed to nicotine for too long, the person can be at increased risk of nicotine addiction, mood disorders, and lowering of impulse control (Adams et al., 2020). Similarly, in both vape pens and electronic cigarettes, the inhalation of the substance allows for the nicotine/THC to reach the brain quicker, providing an addictive high (Gold, 2018). In a developing brain, synapses are being formed and solidified faster than normal rates. Since addiction is a form of learning, a younger person who is using can become addicted faster than adults. This addiction can lead to increased need for a “high” and may make users more likely to become addicted to alcohol or other hard drugs (cocaine) (Adams et al., 2020).

WHAT I HOPE THIS PROJECT ACHIEVES

There were several goals I had in mind when I thought of this project. My main goal was to inform college aged students of the dangers and consequences of using electronic cigarettes. Indirectly, I hoped to inspire students to think about quitting or decreasing their usage of electronic cigarettes overall. The creation of a flyer was designed to be bold and colorful, attracting the attention of students. Even if the students only stopped to read one or two facts before moving on, they are more educated about this issue than they were previously. The flyer could be posted around campus on different billboards or in hallways of buildings. Also, the

flyer could be posted in the bathroom stalls as part of the “stall talk” initiative at Bowling Green State University. The hope is that the factual evidence contained on the flyer will help to educate college students, and in turn create a more widespread knowledge of the population in general. If students become more informed about the harms and consequences of electronic cigarettes, perhaps they will be less likely to continue (or begin) using.

WHAT I HOPE FOR THE FUTURE OF ELECTRONIC CIGARETTE USAGE

In the end, I know electronic cigarettes will never be completely obsolete. My hope would be to inspire younger generations who use these products to decrease their usage, and for those who have never used to become more informed and never begin using. I hope electronic cigarettes will be used for their intended purposes, to help people overcome their addiction to smoking cigarettes. While I strongly believe electronic cigarettes are detrimental to people’s health, I also believe the smoke inhaled from normal cigarettes is even more detrimental to people than the aerosol of electronic cigarettes. Therefore, one hope I have in favor of electronic cigarettes would be that these devices can help those who are attempting to quit cigarette smoking.

Overall, I wish all cigarette addiction would come to an end. However, I have studied the complicated processes of addiction, and I know eradicating these devices will never occur. Not to mention, the economic and political forces will also keep vape products on the market for the foreseeable future. Most importantly, if I can help inform a few people of the dangers these devices pose and, in turn, they inform a few more people, hopefully several lives will be saved from these addictive devices.

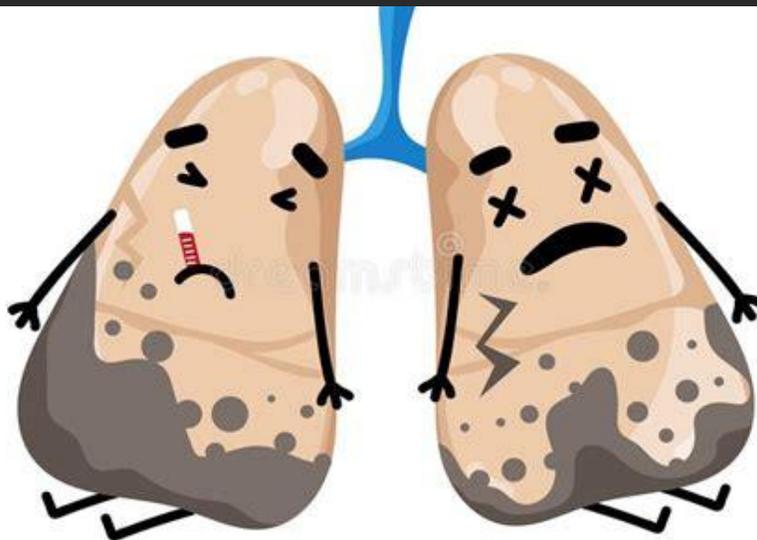
One final hope I have for these products is that more research be done concerning their health effects, chemical compositions, and safety. Staying informed about these devices is

difficult due to the lack of research on the products in general. Lack of research is especially concerning due to the vast amount of people using these devices. The sooner we can make valid, informed, and factual decisions about these devices, the sooner people can realize the possible dangers they are exposed to.

CONCLUSION

Electronic cigarettes and vaping products are widely used, but not widely studied. The health risks and unknown factors within these products are a cause of concern, especially since the vapors are being inhaled directly into the body. The risk of addiction, death, hospitalization, and bodily harm are factors which need to be discussed and relayed to the community. Ensuring the college population is educated about what they are inhaling into their body can create a sense of hope about a future without addiction to electronic cigarettes and vaping devices. Through the creation of a simple yet straightforward flyer to alert people to a few crucial facts about the health risks associated with these products, we can help to educate the college population and hopefully inspire people to stop using and educate others.

THE FLYER



DID YOU KNOW?

ELECTRONIC CIGARETTES HAVE CONSEQUENCES

Get the Facts



Did you know?
There have been over 68 confirmed deaths and 2,807 hospitalized cases from the use of electronic cigarettes and vaping (CDC, 2020).



Did you know?
Electronic cigarettes and vaping devices contain more than just "water vapor", they can contain very harmful chemicals (CDC, 2020).



Did you know?
Using electronic cigarettes and vaping devices can cause addiction and harm the development of the brain (Know the Risk, 2020).

Discover the Truth

Electronic cigarettes are not consequence free. Know the facts. If you or someone you know is suffering from an addiction to these devices, please utilize the following website:

<https://www.centeronaddiction.org/e-cigarettes/tobacco-replacement/how-quit-smoking-or-using-e-cigarettes>

Please go to the following link for more details concerning these facts: <https://scholarworks.bgsu.edu/honorsprojects/index.2.html>

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