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The reason I chose electronic cigarettes as my area of focus for this writing assignment is because it is a new product being offered to the public. Not a lot is known about the long-term negative effects it may have on people who use e-cigarettes and there may be people who assume that it is not harmful at all. I personally don't know a lot about this product, and I want to learn more about it and the consequences it may have on the health of a person. Through the research I find on electronic cigarettes I aim to inform my patients on how it affects the oral and systemic health.

First, it is important to differentiate electronic cigarettes from other tobacco products. According to Gehrig (2020), "Electronic cigarettes, or e-cigarettes, are battery-powered devices that provide doses of nicotine and other additives to the user in an aerosol" (p.350). An electronic cigarette is also referred to as vape or vaping and it's described as "the inhalation of substances (nicotine, flavorings, cannabis, or other popular substances) where oil, liquid, or plant material is heated from these high-tech battery-powered electronic devices to a temperature resulting in the release of an aerosolized water vapor and its active ingredients" (Douglass, 2020). To many people, this may be a safe alternative to traditional cigarette smoking as they are not inhaling any combustible smoke but instead, aerosols.

There is still a lot to be discovered about the negative consequences electronic cigarettes could have in the systemic and oral health. After all, this product was only offered to the U.S market in 2006 (Kumar, 2020). However, it has been found that e-cigarettes do contain carcinogens "a chemical or other substance that causes cancer" (Gehrig, 2020, p. 353). The same publication states, "A 2009 FDA analysis of e-cigarettes from two leading brands found that the samples contained carcinogens and other hazardous materials, including diethylene glycol, which is found in antifreeze" (Gehrig, 2020, p. 350). Another article explaining the effects of electronic cigarettes on dental enamel color stated, "ECIG users are particularly exposed to toxic carbonyl compounds<sup>10</sup> generated by the oxidation of the e-liquid, and also to metals such as tin, silver, aluminum, chromium, nickel, and mercury" (Pintado-Palomino, 2019). It is clear that e-cigarettes contain materials that are harmful to the body.

Electronic cigarettes are thought to be a safe alternative to that of regular cigarettes. However, many studies have shown the negative impacts it can have on the oral health. A study that was done to see if electronic cigarettes increased the growth of carious causing bacteria reported that "publicly available e-cigarette aerosols promoted the growth of *S. mutans*, biofilm formation, and the expression of *S. mutans* biofilm-associated genes (*comCDE*, *gtfBCD*, and *gfpBC*) known as cariogenic bacteria." (Rouabhia, 2021) Another source, "Living under a cloud: Electronic cigarettes and the dental patient", mentioned that "Nicotine causes irreversible changes in the developing brain,<sup>11</sup> predisposing users to addictive behaviors" (Kumar, 2020). And when talking about standard cigarette smoking Gehrig (2020) mentions that "Current smokers are about 4 times more likely than people who have never smoked to develop advanced periodontal disease. Even in adult smokers with generally high oral hygiene standards and regular dental care habits, smoking accelerated periodontal disease" (p. 357). There is no doubt that smoking addiction is a problem that causes there to be a decrease in a patient's health.

The importance of providing smoking counseling to patients during their dental hygiene visit is to make them aware of the health dangers that comes with smoking. As well as encourage and inform patients, who do smoke, the benefits of smoking cessation. Smoking is the most difficult addiction to quit because of nicotine. According to Gehrig (2020), “it is 10 times more addictive than heroin or cocaine and 6 to 8 times more addictive than alcohol” (p. 354). While many say that electronic cigarettes encourage the cessation of traditional cigar smoking there are many concerns that it is not as effective as it is thought to be. Electronic cigarettes possibly even “decreased the likelihood of smoking cessation” (Ramôa, 2017). It is never too late to quit. Doing so can improve the body’s health drastically no matter how long one has smoked. According to Gehrig (2020), “Smokers who quit—even after age 63 years—start repairing their bodies right away. After only 2 weeks, lung function increases by up to 30% in most persons” (p. 347). Therefore, the role of a dental hygienist is valuable in providing smoke counseling to patients who smoke.

There are common methods a dental hygienist can use when providing smoke counseling to a patient who smokes. With a teenager who just started smoking 2 months ago I would discuss why they started smoking and if it is something that they have felt the need to stop doing. I would also discuss the negative effects smoking has on a person’s health. Both systemic and oral health can degrade after long-term use. Smoking affects every part of the body and I want to make sure the patient is aware of that. I would also provide them with needed assistant to start the process of smoking cessation. With a 30-year-old adult I would also inform them of the negative impacts smoking has on the oral health. I would ask them if they ever felt the need to quit in order to understand their point of view. Then, I would encourage them to take measures and provide them with assistance on where they can get help to quit smoking. Another important fact I would mention is that it is never too late to quit. By making immediate changes they will start seeing how their body heals itself.

To conclude, I have learned about the negative effects smoking has on the oral and systemic health. I have also learned about the importance of being informed in new research and case related studies on smoking because there are new products being made or new information of the effects smoking has to our bodies. Such is the case with electronic cigarettes that have recently become popular among adults and even young adults. This assignment was beneficial in that it made me aware on the need to inform patients and others of the importance to not smoke or to stop smoking. It is one of the leading causes of so many deaths every year which is why as a dental hygienist we play an important role in encouraging a patient who smokes to quit and provide them with the resources they need to do so. I personally do not know of a family member or a friend who use tobacco products or have used it in the past. But learning about electronic cigarettes and tobacco smoking has made me feel more comfortable in having a conversation about smoking cessation. I hope to keep on learning more about tobacco use and the importance of sharing this information with patients as a dental hygienist.

## References

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