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Electronic Cigarettes: A New Generation of Smoking

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ELECTRONIC CIGARETTES:
A NEW GENERATION OF SMOKING

A Capstone Experience/Thesis Project

Presented in Partial Fulfillment of the Requirements for

the Degree Bachelor of Science with

Honors College Graduate Distinction at Western Kentucky University

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ABSTRACT

Electronic cigarette smoking is a trend that has become very popular in the United States in recent years. As e-cigarettes continue to gain popularity, it is important for dental professionals to be up-to-date on the dangers that they pose.

An interview session consisting of a questionnaire was the methodology used in this study. Ten dental hygienists who work full or part-time in private practice settings were interviewed. After the interview questions were asked, the researcher discussed the effects of electronic cigarettes can have on oral and overall health. Last, the data were analyzed to determine if dental hygienists included electronic cigarettes in their offices' medical history questionnaire.

Results revealed that none of the hygienists questioned included electronic cigarettes on the medical history questionnaire. Results also indicated that all 10 of the hygienists believed that e-cigarettes can be harmful. Of the 10, 5 still recommended them as a way to quit traditional cigarette smoking.

Keywords: electronic cigarettes, dental hygienist

Dedicated to my parents, my sisters, Aaron and the Faculty and Staff of the WKU Dental Hygiene Program who strive on a daily basis to make my dream of being a great dental hygienist a possibility.

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To the Dental Hygiene Class of 2015, especially, “The Toothpicks” for all of our wonderful memories together.

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TABLE OF CONTENTS

	<u>Page</u>
Abstract.....	ii
Dedication.....	iii
Acknowledgements.....	iv
Vita.....	v
Chapters:	
1. Introduction.....	1
2. Review of Literature.....	2
3. Methodology.....	6
4. Results.....	7
5. Discussion.....	9
6. Appendix.....	11
References.....	12

CHAPTER 1

INTRODUCTION

Electronic cigarette smoking is an activity that has continued to gain popularity in the United States over the past few years (CDC, 2014). The use of electronic cigarettes involves adding a nicotine-containing liquid to a battery-powered device that heats the liquid and expels it as a nicotine vapor. While electronic cigarettes are used by many as a means to cut back on traditional cigarette smoking, they are also a pathway for non-smokers and adolescents to become addicted to nicotine which can lead to increased traditional cigarette smoking. A common question about electronic cigarette use is, “Why do people choose to smoke electronic cigarettes?” It is important for the dental hygienist to know why people choose to use electronic cigarettes and especially what attracts adolescents and young adults to them. Electronic cigarettes are very accessible to minors, and in some states more accessible than traditional cigarettes (Grana, 2013). According to the CDC, complete harmful effects of e-cigarettes are not currently known, but the effects of nicotine on the human body have been established. Also, many news sources have reported incidences of children being poisoned by the nicotine liquid (CDC, 2014). Since dental personnel frequently discuss cigarette use with their patients, it is important to know if dental personnel are discussing e-cigarettes with their patients. Do hygienists realize the potential harmful effects that e-cigarettes present to their patients? Do they ask patients about e-cigarette use or educate them on the effects?

CHAPTER 2

REVIEW OF LITERATURE

A review of the literature concerning electronic cigarettes is necessary to understand the effects they may have on the oral cavity. Recent studies have found that most electronic cigarette cartridges contain the same chemicals as traditional cigarettes, only in much smaller amounts. Other studies have shown that the amount of nicotine in electronic cigarettes often differs from the amount labeled on the cartridge due to a lack of regulation on the contents. The number of calls to poison control centers and reports of explosions involving the e-cigarette have dramatically increased in the last year. This chapter will examine the current knowledge on the subject.

Electronic cigarettes, also known as e-cigarettes, are battery-operated devices that imitate traditional cigarettes but do not contain any form of tobacco. Since they became available for purchase in the United States in 2007, use of them has sky-rocketed among smokers and nonsmokers alike. E-cigarettes emit a nicotine-containing vapor without a smoky odor and are available in many different flavors such as conventional cigarette flavor, strawberry, caramel, coffee, cinnamon, and bubblegum. They also contain other additives such as propylene glycol to produce aerosols (Grana, 2013).

Electronic cigarettes have become popular among people of all ages due to their availability online and general acceptance as a “healthier” alternative to traditional cigarettes. They have been used by people with and without a history of smoking and,

according to the CDC; many states still do not have laws regulating the sale of e-cigarettes to minors. According to the Food and Drug Administration, only electronic cigarettes that are marketed for therapeutic purposes are currently regulated. The public should be made aware of the potential damages that can be caused by electronic cigarettes in order to make educated decisions regarding whether or not to use them. As long as electronic cigarettes continue to go unregulated by the FDA, Americans may continue to buy them without knowing any of the associated risks.

Schroder and Hoffman (2014) conducted a study to evaluate the nicotine pharmacology of electronic cigarettes in order to understand the potential impact of electronic cigarettes on the user and public health. The researchers reported that nicotine affects the central nervous system, typically causing an increase in blood pressure and heart rate and that all of the e-cigarettes studied contained some level of nicotine.

The data used in this study were taken from sixteen electronic cigarette (e-cigarette) studies that were published from 2009 to 2013. All of the studies were conducted on both male and female participants eighteen years of age or older. Five of the studies measured nicotine exposure in participants with no previous e-cigarette use. Other studies were conducted on participants who had experience smoking e-cigarettes. The study aimed to evaluate the levels of nicotine in a puff of electronic cigarette vapor.

Schroder and Hoffman (2014) found that the majority of electronic cigarettes studied contained less nicotine per puff than traditional cigarettes. Further research, however, revealed that e-cigarettes can deliver similar amounts of nicotine as traditional cigarettes using methods that may better represent current e-cigarette use. Many nicotine

cartridges also had a discrepancy in the labeled amount of nicotine and the actual level of nicotine in the liquid, which was usually more than the labeled level.

Electronic cigarettes pose a danger to users by providing vapors that contain many unregulated levels of nicotine and other chemicals. They also provide a source of initial nicotine dependence to non-smokers and adolescents, creating a gateway to increased e-cigarette smoking and potentially traditional cigarette smoking. Grana (2014) conducted a study to reveal how likely adolescents are to try electronic cigarettes. The author reviewed a survey of 228 adolescent males who completed a survey about tobacco use. The participants stated that they were 74% more likely to try electronic cigarettes as opposed to traditional cigarettes. Many young adults choose electronic cigarettes because they think they are less harmful than traditional cigarettes. The public should be educated on the harmful effects of electronic cigarettes to raise awareness and prevent adolescent nicotine dependence.

The potential harmful effects of electronic cigarettes are not only related to inhaling the nicotine vapor. Reports of poisonings and explosions due to electronic cigarette use have increased as e-cigarettes have increased in popularity. Poisoning involving e-cigarettes is due to the nicotine liquid and can occur in three ways; by absorption through skin or eyes, by ingestion, or by inhalation.

A study conducted by the Centers for Disease Control (2014) that compared total monthly e-cigarette and traditional cigarette poison control centers found that the proportion of calls to poison control centers involving e-cigarette liquids containing nicotine jumped from 0.3% in September 2010 to 41.7% in February 2014. More than half (51.1%) of the calls involved children under the age of five and 42% involved people

ages 20 and over. The most common health effects reported were vomiting, nausea, and eye irritation. The study used data from poison control centers in all 50 states, the District of Columbia, and U.S territories. The data revealed an alarming rate of increase, but the incidence may be more severe because not all cases of poisoning are reported to poison control. As e-cigarettes increase in popularity, the dangers of electronic cigarettes continue to become more common.

Explosions of electronic cigarettes while being used by consumers have been reported by many news sources. ABC News reported in February 2012 that a Florida man lost all of his teeth and part of his tongue due to an e-cigarette explosion that also set fire to part of his home. Police discovered that a faulty rechargeable lithium battery was to blame for the explosion.

Electronic cigarettes present a major problem to consumer health due to the contents of the e-cigarette liquid and their unregulated manufacturing and sale that makes them as dangerous as traditional cigarettes. A review of the literature has covered what electronic cigarettes are, what they contain and ways that they are harmful to the consumer and the family of the consumer. Still missing from the literature is further research regarding dental professionals and how they discuss and educate patients on electronic cigarettes. The next chapter will describe the methodology used in the study.

CHAPTER 3

METHODOLOGY

This research study examined dental hygienists' knowledge about electronic cigarettes. An interview session using a questionnaire took place involving a convenience sample of ten dental hygienists. The researcher met with ten individuals who were currently working in a private dental practice. Information gathered from the subjects included: if they include the use of electronic cigarettes in medical history questionnaires, do they recommend them to patients as a form of smoking cessation, and do they educate adolescent patients on the similarities between electronic cigarettes and traditional cigarettes. After the interview, the researcher educated the hygienists on the effects of electronic cigarettes on the oral cavity and overall health. The researcher also compared electronic cigarettes and traditional cigarettes in terms of the negative effects and FDA regulations. After discussing the facts about the negative effects of electronic cigarettes, the interviewees were asked if they were aware of this information.

The purpose of this project was to determine whether or not hygienists were aware of the harmful effects that electronic cigarettes can have on their patients' overall health and especially oral health. The next chapters will present results and discuss how these results can be used to improve knowledge and overall health.

CHAPTER 4

RESULTS

This chapter will examine results from the interviews of 10 dental hygienists that currently work in a private practice setting. The interview revealed how many of the interviewees include questions about electronic cigarettes in their medical history questionnaire.

All 10 of the hygienists reported that they work full or part-time as dental hygienists in a private practice setting. Every participant stated that the office in which they work does not typically ask patients about e-cigarette use. Four reported that e-cigarette use came up during conversations with patients. All 10 of the interviewees stated that they do think that electronic cigarettes can be harmful. Susan, an experienced hygienist stated, "I have never asked my patients about e-cigarettes, mostly because I don't think about it. I do think we should add them to the questionnaire to remind the patient and myself about them."

Results showed that most hygienists do think that electronic cigarettes can be harmful. Shiloh, a part-time hygienist at a pediatric dental office noted "she does think that they can be harmful because they still contain nicotine." And Adela, stated "I think that smoking anything is harmful, just because you are inhaling smoke which is harmful to your lungs." Five individuals reported that they do not recommend electronic

cigarettes to patients as a form of quitting use of traditional cigarettes, while five others stated that they have or would recommend them to patients if it helps to reduce traditional cigarette smoking.

Finally, all ten hygienists reported that they did not educate adolescents and their parents about the harmful effects of electronic cigarettes. Most of the hygienists reported that they did not realize the potential harmful effects that electronic cigarettes may have on the adolescent patient. Research shows a significant link between adolescents who use electronic cigarettes also being involved in other forms of tobacco Grana (2014). In the next chapter, practical applications of these results will be discussed.

CHAPTER 5

DISCUSSION

The previous chapter analyzed the data on the involvement of electronic cigarettes in medical history questionnaires in the dental office. E-cigarette use has become a worldwide phenomenon, especially in the United States. All health professionals should be up-to-date on the latest research on electronic cigarettes to help educate patients on the harmful effects. None of the subjects who were interviewed reported including electronic cigarettes on their medical history questionnaire, while they all reported that they believe e-cigarettes can be harmful. While five participants reported not recommending electronic cigarettes as a form of smoking cessation, five others reported that they would.

Since electronic cigarette use is becoming widespread, it would be beneficial to spread awareness on the rise of electronic cigarettes and their effects. Implementing lectures and continuing education courses to educate dental health professionals could become a crucial factor in decreasing the prevalence of e-cigarette smoking. It is important to educate healthcare professionals on the negative effects on the body and oral cavity, as well as to explain the potential poisonings and explosions that these devices have caused. The researcher believes that extending this knowledge from dental professionals to patients will help in reducing the amount of individuals who become interested in trying the new fad.

From interviewing subjects, the researcher believes that most dental professionals are not aware of the harmful effects that can arise from electronic cigarettes and therefore, do not educate patients about them. This is especially true with adolescents as research has shown that individuals who have tried e-cigarettes often use other forms of tobacco as well (Grana 2014). Altogether, e-cigarette use is on the rise and education on this new fad should be acquired in order to properly gain knowledge on the harm that can result from the use of electronic cigarettes. Especially troubling is new research which suggests that use of e-cigarettes among adolescents is rapidly increasing. Dental professionals must be aware of this trend so that they may properly educate their patients, especially as use of e-cigarettes has been linked to increased use of other forms of tobacco. It is important to educate the professionals who are trusted to be up-to-date on all trends that affect the oral cavity.

Appendix A

1. Do you include questions about electronic cigarettes in your medical history questionnaire?
If not, do you think that you should?
2. Do you think electronic cigarettes can be harmful?
3. Do you recommend electronic cigarettes as a form of smoking cessation to your patients?
4. Do you educate your adolescent patients and their parents on the effects of electronic cigarettes?

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