Expectancies of the Adult Electronic Cigarette User: A Quantitative Descriptive Study

Ann Marie Jacobs

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Expectancies of the Adult Electronic Cigarette User

A Quantitative Descriptive Study:

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Daemen College

A Thesis Submitted to the Faculty of Daemen College in Partial Fulfillment of the Requirements for the Degree of

Masters of Science Adult Gerontology Primary Care Nurse Practitioner

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Acknowledgement

I would like to express my sincere gratitude to my parents James and Irene Bonsack for their continued support and encouragement throughout this journey. Their belief in me never faltered. It is because of their confidence in me that I am here today completing my Master’s Degree. I would also like to thank my closest friends and classmates whom I relied on to hold me accountable in our study group. Janet Wysocki Freer, Elizabeth Bless, and Barbara Rogers. We all arrived at this particular time and place coming from very different backgrounds; however we ultimately became strong enough by supporting each other through our individual ups and downs. I also would like to thank my thesis chair Dr. Lisa Ball, for her patience and guidance during this process.

I thank God for continued good health for me as well as my family. One small illness or injury can change the outcome of each semester, and I was well aware, that at times we were hanging on a thread. Thank you Lord, for giving me the strength to persevere.

Lastly, I hope that I have exhibited strength and courage as a way to show my children that for it is with hard work and dedication that achievement is attained. I hope that I have inspired them to continue on in their education, and prove to them that knowledge is never wasted. You are never too old to learn!
Dedication

I would like to dedicate this thesis to my parents, James and Irene Bonsack, as well as my children, Joshua and Erik Jacobs. For it was their unwavering love and support that allowed me to accomplish all of the hurdles that this degree entailed. I need to express my thanks to my children for understanding that “take-out” was “what’s for dinner” during these last semesters. I’d like to thank them for assisting me with Health Assessment, as they often played the role of the patient that I was examining. I must also thank my co-workers in the Intensive care Unit at Kaleida Health for their continued encouragement and assistance with my work schedule. I recognize that I was not always easy to work alongside of when my mind was overcome with other deadlines. A special thanks to Jacqueline Gallagher DNP, BS, MS, ANP-C,ACNP-C for accepting the challenge of a becoming my second reader, I appreciate her guidance and wisdom. Their continued support and understanding is what true friendships are made of. While the journey has been long and stressful I would not have been able to succeed without each and every one of them!
Abstract

Objectives: Research has shown trends in electronic cigarette use have grown to overwhelming proportions since their introduction to the U.S. market in 2007. The purpose of this thesis study was to explore older adult expectancies associated with the use of electronic cigarettes.

Methods: A quantitative, descriptive survey study was conducted utilizing the Short Form Vaping Consequences Questionnaire (S-VCQ), (Morean & L’Insalata, 2017), a modified version of the Short Form Smoking Consequences Questionnaire, (Myers, 2003), in order to assess expectancies of the electronic cigarette user in the adult population, age 50 years and older. Dorothea Orem’s Self Care Deficit Nursing Theory was the theoretical nursing framework that fit with this study. An online survey was used to collected data from members of the National Vaping Network, which consists of 10,000 members who currently utilize electronic cigarettes.

Findings: While overall response rate was low, most findings reported were similar to those found in current studies. A total number of forty nine participants responded to the survey; five were excluded due to not meeting the inclusion criteria related to age, resulting in forty four surveys being included in the final analysis. The sample consisted largely of middle class Caucasian women who had a high school or some college education. Overall, 90% of the participants were former smokers. Results demonstrated that most participants associated vaping with taste, flavor, enjoyment, sensation and as a method to reduce tension and anxiety.

Conclusions: These findings illustrate the need for further research on the topic of electronic cigarettes and their overall health effects on patients. Nurse Practitioners must expand their knowledge regarding smoking devices of any sort in an attempt to enhance patient awareness, overall health, and successful smoking cessation.
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Chapter 1: Introduction

Chapter 1 discusses the background, purpose, significance, and theoretical framework of the current study. The research question that influences this study as well as the assumptions and definition of terms are presented at the end of chapter one.

Background

While most Americans are aware of the health risks associated with cigarette smoking, nicotine addiction remains widespread among the adult population (Nelson et al., 2015). In light of ongoing declines in conventional cigarette smoking prevalence, data suggests rapid increases in the use of e-cigarettes (Schoenborn & Gindi, 2015). Smokers continue to struggle with their ability to quit in spite of the known dangers of tobacco smoke, including the associated risks of developing chronic end-stage pulmonary disease, and an increased risk for the development of numerous cancers, (Erikson, Mackay, & Ross, 2012).

According to the Center for Disease Control and Prevention (CDC, 2017), cigarette smoking kills more than 480,000 Americans every year, and smoking related disease in the United States costs more than $300 billion per year. This includes nearly $170 billion in direct medical care costs for adults and $156 billion in lost productivity. Regardless of this burden and the increased awareness regarding the dangers of smoking, cigarette smoking remains the major preventable cause of death in the United States (Rutten et al., 2015).

The modern cigarette was introduced approximately 40-60 years ago, due to the 1964 Surgeon General report, which increased our knowledge regarding the negative effects of cigarette smoking (Weaver et al., 2016). These new filtered low tar cigarettes replaced cigars, chewing tobacco, and unfiltered cigarettes as a direct attempt to reduce harm. By 1969, The Public Health Cigarette Smoking Act required that a health warning be placed on cigarette
packages (CDC, 2009). The National Clearinghouse for Smoking and Health and its newly formed organization, the Centers for Disease Control and Prevention’s Office on Smoking and Health, have continually supported successful programs in an attempt at reducing overall tobacco use (CDC-2009). These programs have significantly reduced cigarette use from 42% of the U.S. population compared to 18% today (Heath et al., 2017). Approximately 21% of men and 17% of women continue to smoke (Goroll & Mulley, 2014). These statistics, and their associated rising healthcare costs, prompted the development of guidelines which require clinicians to assess each patient’s smoking status and provide assistance towards smoking cessation. The U.S. Public Health Service (USPHS) recommended that all health care providers identify and treat tobacco users by integrating the evidence based “5 A’s” framework: ask about tobacco use, advise to quit, assess readiness to quit, assist in a plan to quit, and arrange proper follow up to quit (Heath et al., 2017). In an attempt to decrease overall smoking trends, antismoking campaigns have banned smoking in restaurants, office buildings, and hospitals, while increased taxes placed on cigarettes have made smoking addiction more costly. The results showed that the smoking epidemic had reached its lowest point with fewer adults smoking until 2003 (Soule, Rosas, & Nasim, 2016).

Electronic cigarettes were developed in China in 2003, and introduced to the U.S. market in 2007 (Born et al., 2015). E-cigarettes, also known as electronic cigarettes, are battery powered devices that heat a solution usually containing nicotine and deliver this as an aerosol that is inhaled by the user (Kalkhoran & Glantz, 2016). These new devices were seen as an adjunct toward smoking cessation, in addition to continuing to provide nicotine through inhalation. The fact that they were unregulated in public buildings, as well as outdoors meant smokers could continue to abuse nicotine with these new smokeless devices.
Due to its new unique design, the electronic-cigarette market was completely unregulated for years; therefore, minors were able to buy electronic cigarettes and liquid nicotine unsupervised online. By 2016, the U.S. Food and Drug Administration (FDA) extended its governing authority over tobacco products to include these electronic nicotine as well as non-nicotine delivery systems/devices (Weaver, Kemp, Heath, Pechacek, & Eriksen, 2017). Chapman and Wu (2014) found that children as early as middle school and young adults in high school have doubled their use of electronic cigarettes, with the majority of these adolescents having never tried a conventional cigarette. However, adults appear to have different motivating reasons that encourage their use of electronic cigarettes. These include smoking cessation, cost, flavor, and convenience (Chapman & Wu, 2014). This study will attempt to identify the expectancies of the adult electronic cigarette user (age 50 and older), and what motivates their continued use.

Nurse Practitioners must determine which patients are smoking conventional cigarettes or utilizing the e-cigarette in order to develop a plan of care for this specific patient population. Electronic cigarettes users often consider themselves non-smokers, as they don’t use conventional cigarettes. Frequently they become dual users: vaping their electronic cigarette as well as smoking traditional cigarettes, which may present new complications for these particular patients. Several studies suggest those that use electronic cigarettes may be increasing their nicotine addiction, and therefore may be increasing their conventional cigarette use (Zborovskaya, 2016). The relationship between outcome expectancies and its influence on use has been studied in addictions associated with alcohol, drug use, and smoking (Brown, Goldman, Inn & Anderson, 1980; Cooper, Russell, & George, 1988). By understanding the expectancies of the adult who uses electronic cigarettes healthcare providers, including Nurse Practitioners may become better versed at developing a plan toward improved smoking cessation methods.
Study Purpose

The purpose of the study was to identify and expand on existing research regarding vaping expectancies of the adult (age 50 years and older) electronic cigarette user. Knowledge of motivating factors for this population will provide insight for the Nurse Practitioner in identifying those individuals who are current smokers, vapers, or dual users. The Nurse Practitioner must be cognizant of the current patterns and smoking habits of their clients in order to appropriately treat this particular patient population. Further research is needed to expand on the topic of electronic cigarette use and its influences on health promotion in the adult population.

Research Question

The research question for this study is: What are the expectancies and associated demographic findings of adults, age 50 and older, utilizing electronic cigarettes? The results of this study will determine how the electronic cigarette is utilized in the adult, and what the vaping expectancies of this specific population are. The findings of this research study may assist the Nurse Practitioner in determining assessment strategies for readiness to quit in their patients.

Significance

Electronic cigarettes were developed and initially marketed as a healthier alternative toward smoking cessation (Zborovskaya, 2016). The U.S. Preventative Services Task Force has determined that evidence is lacking to recommend e-cigarettes for smoking cessation in adults; however, prevalence and use continue to rise. By determining the specific outcome expectancies of the adult electronic cigarette user, the Nurse Practitioner will have an increased understanding of nicotine addiction and the additional motivating reasons that drive the adult population toward use. Current research has suggested that the introduction of the electronic cigarette has not lead
to fewer smokers but has created either new smokers or dual smokers. Dual smokers are those who continue to smoke conventional cigarettes as well as electronic cigarettes (McMillen, et al., 2015). To date, there is limited data available on the outcome expectancies of the adult vaper (age 50 and older).

Healthcare providers need to continue to screen and advise their clients regarding the dangers of smoking as well as vaping. Nurse Practitioners must expand their knowledge and understanding of these new nicotine delivery systems that their patients are utilizing in order to provide proper interventions for these patients.

**Theoretical Framework**

Dorothea Orem’s Self Care Deficit Nursing Theory was used as the theoretical framework in this study. Orem’s Self Care Nursing Theory or the Orem Model of Nursing was developed by Dorothea Orem between 1959 and 2001 (https://nurselabs.com). Orem defines Nursing as “the act of assisting others in the provision and management of self-care to maintain or improve human functioning at the home level of effectiveness” (https://nurselabs.com). Her theory of self-care serves as the foundation of every individual’s core ability to perform and maintain life, growth, and well-being (McEwen & Wills, 2011). Individuals are believed to function on a constant ever-changing continuum in order to maintain a balance between their health and wellness. These individuals act independently, and within learned and accepted environmental constraints. As the individual client becomes ill they move out of this normal range, and are unable to provide their own self-care and will seek assistance from a healthcare agency. The illustration below reflects the continuous balance of an individual’s health and wellness (Bunye, 2010).
Orem’s theory is composed of three interrelated hypotheses. The theory of self-care focuses on each individual’s ability to perform self-care. The self-care deficit theory describes the patient who is unable to provide their own self-care. The third hypothesis is the theory of nursing systems which consists of the nurse/client relationship (nursingtheories.weebly.com). The theory of nursing systems is defined by wholly compensatory (requiring total care of the patient), partial compensatory (moderate assistance required from nursing to assist the patient), and supportive/educative (the patient may be able to perform self-care but is looking for guidance and support in order to succeed). In the supportive/educative phase, an individual seeking to quit smoking may consider an electronic cigarette as a means to assist them in their ability to quit, and/or seek out the guidance of the Nurse Practitioner.

In the study “A Community-Based Smoking-Cessation Program: Self-Care Behaviors and Success” by Williams-Utz, Shuster, Merwin, and Williams (1994), Dorothea Orem’s Self-Care Deficit theory was used to examine specific individual descriptive variables in smoking cessation that individuals displayed which may have led to their success in ending their smoking habit. Results showed that nicotine addiction was markedly associated with those individuals whom were unable to quit smoking. Overall, 15% were able to quit smoking and 41.5% reported reducing their overall smoking habit. In general, smoking was considered a process in which patients may seek guidance, and may experience several failed attempts prior to success, all
while learning and adjusting within their own self-care continuum. Each time an individual
attempts to quit smoking they may learn and develop skills within their own self-care, which
may assist them in their future success.

Assumptions

The study assumes that the survey was answered only by subjects who met the inclusion
criteria, including age and current electronic cigarette use. The study assumes that the subjects
answered the survey honestly and that each survey was completed by a single e-cigarette user.

Definition of Terms

1. **Electronic Cigarettes** - also known as e-cigs, mods, vape pens, tank systems, and electronic
   nicotine delivery systems. For the purposes of this study all will refer to electronic e-cigarettes; a
device used to simulate the experience of smoking, having a cartridge with a heater that
vaporizes liquid nicotine instead of burning tobacco (www.dictionary.com). These e-cigarettes
come in a variety of shapes and sizes. Most consists of a battery, heating element, and a place to
hold liquid. E-cigarettes produce an aerosol to be inhaled into the lungs that is heated and usually
contains nicotine, flavorings and other chemicals.

2. **Vaper** - a person who uses electronic cigarettes (www.urbandictionary.com)

3. **Dual User** - a person who smokes conventional tobacco cigarettes and uses electronic
   cigarettes.

4. **Vaping Expectancies** - Individuals’ ratings of possible consequences related to vaping

5. **Smoking** - is the inhalation of the smoke of burning tobacco encased in cigarettes, pipes, and
Summary

Chapter 1 has presented an overview of the prevalence of e-cigarette use as well as its associated financial burden in the United States. The relevance of the study including background information, the purpose of the study, research question, significance, assumptions, and definition of terms was discussed. A theoretical framework was presented and incorporated to guide the study. Chapter 2 will review the current literature related to the study and Chapter 3 will provide the methodology utilized in this study.
Chapter 2: Review of Literature

A review of literature pertaining to electronic cigarettes will be presented in this chapter. Several data bases including EBSCOhost, PubMed, and Cinahl were searched using the following keywords: electronic cigarette use, vaping, adult population, prevalence of, knowledge, perceptions and attitudes of electronic cigarette users. The review included the most recent studies (from the past few years) plus relevant publications from 2006. Studies in languages other than English were excluded. Studies of strictly adolescent electronic cigarette users were also excluded. Studies related to the unknown effects of use were not utilized.

Studies reviewed for this research consisted of questionnaires as well as statistical and demographic findings on smoking behaviors, former smokers verses current smokers, history of smoking cessation, gender, race, educational level, employment, and current income level. A total of ten studies were reviewed and discussed: (1) “Trends in Electronic Cigarette Use among U.S. Adults-for Both Smokers and Non-Smokers” (McMillen, Gottlieb, Shaefer, Winickoff & Klein, 2015); (2) “E-Cigarette Prevalence and Correlates of Use among Adolescents verses Adults: A Review and Comparison” (Chapman & Wu, 2014); (3) “E-Cigarette Use in the Past and Quitting Behavior in the Future: A Population Based Study” (Al-Delaimy, Myers, Leas, Strong & Hofstetter, 2015); (4) “Patterns of Electronic Cigarette Use Among Adults in the United States” (Delnevo, et al., 2016); (5) “E-Cigarettes and smoking cessation in real world and clinical settings” : a systematic review and meta- analysis (Kalkhoran & Glantz, 2016); (6) “The Short Form Vaping Consequences Questionnaire: Psychometric Properties of a Measure of Vaping Expectancies for Use with Adult E-Cigarette Users” (Morean & L’Insalata, 2017); (7) “Electronic Cigarettes: A Primer for Clinicians” (Born, et al., 2015); (8) “Use of Nicotine in Electronic Nicotine and Non-Nicot ine Delivery Systems by U.S. Adults” (Weaver, Kemp, Heath,
McMillen et al. (2015) utilized a four year, multi-mode survey to obtain a cross sectional sample of U.S. adults. The study was conducted between 2010 and 2013, and had sample sizes greater than 3000 per study each year. The researchers assessed trends in use of electronic cigarettes among U.S. adults, including demographic predictors of use and smoking status of the participants current electronic cigarette use. The conclusions revealed that while there has been rapid growth in electronic cigarette use from 1.8% to 13%, those who had ever-used an electronic cigarette also increased. This was highest among young adults and current cigarette smokers. The study showed that electronic cigarette use had increased in all populations including adolescents that never smoked, current smokers, and former smokers. The data indicated that one third of current e-cigarette users were non-smokers, and that current use had increased by 2,167% from 2010 to 2013. The study demonstrated that the rapid evolution of the electronic cigarette in the U.S. was parallel to other countries which allow e-cigarettes. This suggests that electronic cigarettes add to the overall prevalence of smoking and nicotine addiction as opposed to supporting smoking cessation.

The research suggests that young adults (age 18 to 25) were more likely to have tried e-cigarettes, and half of all adults age 18 through 65 who had experimented with e-cigarettes continued to use them. The research demonstrated that current smokers, nondaily smokers and former smokers remained a predictor of ever and current electronic cigarette use as did age, race and education. White adults were more likely than black adults, younger adults were more likely
than older adults, and adults with some college were more likely than adults with a college
degree to have tried electronic cigarettes. The data also indicated that approximately 40% of
former smokers reinitiated their tobacco use. This research illustrated the rapid growth in the use
of the electronic cigarettes, and suggested how these may negatively impact the future of
preventable chronic disease (McMillen et al. 2015). It was suggested that further regulatory
action was required at the federal, state and local levels to safeguard these products so they do
not contribute to preventable chronic disease states.

Chapman and Wu (2014) reviewed 21 studies divided into separate categories. Twelve
studies focused on prevalence and correlates of use, and nine studies focused on preferences,
habits and perceptions of use. These studies suggest that e-cigarette use is increasing among U.S.
adults and that the 2011 adult lifetime use prevalence is comparable to that of young adults.
Adult awareness, trial use, and prevalence more than doubled from 2011 to 2012. Nondaily
smokers and those viewing e-cigarettes as less harmful than traditional cigarettes were more
likely to initiate electronic cigarette use.

It was determined that while 75% of adult vapers used these devices to reduce their
traditional cigarette consumption, only seven percent used them to quit tobacco (Chapman &
Wu, 2014). Most cigarette smokers expressed belief that e-cigarettes would help them quit
smoking, and that e-cigarettes were better for their over-all health. In total, 79% of the
participants continued using e-cigarettes to prevent relapse to their former smoking habits. While
prevalence increased mostly among the young adult population, the research addressed gateway
and reverse gateway theory. This theory suggests that as adolescent use of one substance
increases, the likelihood of using other substances also increases. The researchers state that e-
cigarette experimentation may renormalize cigarettes and work as a gateway for tobacco or other
substances. This study proposes that as young adults experiment with electronic devices, a new
generation of smokers may be created (Chapman & Wu 2014).

Al-Delaimy et al. (2015) surveyed 1000 California smokers at two time points, one year
apart, to examine whether smokers who used e-cigarettes were more likely to quit after one year
than smokers who had never used e-cigarettes. A logistic regression analysis was used to
determine whether baseline e-cigarette use was a predictor of quitting behavior. The purpose of
the study was not to determine whether e-cigarettes can be considered an effective quitting aid,
but rather to describe the behavior of smokers who are drawn to these products and to determine
whether they are more likely to become successful quitters. The study concluded that smokers
who have used electronic cigarettes may be at greater risk for being unable to stop smoking. The
use of electronic cigarettes, electronic nicotine delivery systems, personal vaporizers and vaping
cigarettes is described as a rapidly expanding phenomenon. The research suggests that these
new nicotine delivery systems may be encouraging new forms of nicotine addiction. The study
findings contradicted the primary hypothesis that smokers who had ever used e-cigarettes would
be more likely to abstain from smoking cigarettes at one year follow up than those who stated
they never use these products. The study indicated that electronic cigarette use was significantly
associated with cessation failure rather than success (Al-Delaimy et al., 2015).

Delnevo et al. (2016) analyzed data from the 2014 National Health Interview Survey and
examined how use patterns differed by demographic subgroups and measures of cigarette
smoking. The authors concluded that electronic cigarette use among those who never smoked is
extremely low (0.4%), as well as former smokers who quit smoking four or more years ago
(0.8%). Increased daily use was seen most commonly in young adults who quit smoking within
one year (13%), and older adults. This study presents the first National Health Interview Study
estimates of ever, current and daily e-cigarette use and highlights how e-cigarette use patterns differ by various smoking status and socioeconomic subgroups. The study concluded that e-cigarette experimentation was extremely low for adults who never smoked cigarettes or who quit more than four years ago. This suggests that e-cigarettes neither encouraged the induction of use nor relapse among adult usage of these devices. The researchers strongly infer that studies are needed that demonstrate the current tobacco retail environment and their subsequent use of these products so that we may draw conclusions that may assist practitioners and policy makers in the regulation of these devices.

Kalkhoran and Glantz (2016) performed a systematic review and meta-analysis of clinical trials and observational real world studies to assess the association between e-cigarettes and cigarette smoking cessation among adults. Of the 38 studies reviewed, there were 20 control groups, 15 cohort studies, three cross sectional studies, and two clinical trials. Findings showed that odds of quitting cigarettes were 28% lower in those that used e-cigarettes compared to those who did not use e-cigarettes. The researchers determined that e-cigarettes were marketed and promoted to allow users the convenience of vaping in areas where smoking is prohibited. The results showed that current users of electronic cigarettes were smokers with a willingness to stop smoking and those electronic cigarette users may be 20% more likely to stop smoking. While overall interest in quitting cigarette smoking is a common reason for using electronic cigarettes, how they are regulated and marketed to the general population will play an important role on the overall impact on public health. Further research is needed to determine the effect of electronic cigarette use factors including motivation to quit, and assist in distinguishing the e-cigarette users’ rationale for utilizing these devices.
Morean and L’Insalata (2017) utilized an anonymous survey on Amazon Mechanical Turk in 2015. They utilized 522 participants from a sample of 600 respondents. Participants reported on biological sex, age, and race. The researchers utilized a modified version of the Short Form Smoking Consequences Questionnaire (S-SCQ) that assesses expectancies for negative consequences by the following statements: by smoking/vaping, I risk heart disease or lung cancer; and the more I smoke, the more I risk my health. Positive reinforcement was defined: I enjoy the taste of smoking/vaping. Negative reinforcement was defined: smoking/vaping helps me deal with depression; smoking/vaping helps me cope. Regarding appetite/weight control: smoking/vaping helps control my appetite and e-cigarettes keep me from overeating.

Results demonstrated that women reported stronger expectancies for appetite and weight control associated with vaping than did men. Other findings state that dual cigarette/e-cigarette users reported stronger expectancies for negative vaping consequences and negative reinforcement associated with vaping than did nonsmokers. This study determined that vaping and smoking consequences versus smoking and vaping expectancies were related yet distinct concepts. Lastly, stronger vaping expectancies for positive reinforcement, negative reinforcement, and appetite/weight control were associated with increased vaping frequency and e-cigarette dependence. The authors encouraged other researchers to utilize this measure for assessing vaping expectancies in adult e-cigarette users.

Born et al. (2015) reviewed recent research and randomized control trials in order to introduce the Otolaryngology community to the current state of research regarding electronic cigarettes. The study attempted to identify mechanisms, impact on health and addiction as well as smoking cessation likelihood. The data concluded that older adults utilized electronic cigarettes as a smoking cessation tool compared to younger users. As of 2015, research data was...
inconclusive on whether electronic cigarettes demonstrated successful attempts toward smoking cessation compared to other methods. Research is also lacking as to the overall health and safety of these electronic cigarette devices.

Born et al (2015) capitalized on the electronic cigarette industry report that there was an estimated two billion dollars in retail sales in 2013 and was expected to exceed ten billion dollars in 2017. While the percentage of adults who had tried e-cigarettes increased from 0.6% in 2009 to 8.1% in 2013, there has been a threefold increase in users for youths in grades 6 through twelve. Providers must stay abreast of the current use of these new nicotine delivery systems within certain patient populations in order to better counsel their patients regarding the benefits and risks of electronic cigarettes. E-cigarettes are new to the market and have not achieved widespread use adequate enough to be evaluated for their long term health effects. Studies conducted on e-juice tend to be poorly designed and do not mimic actual exposure that would occur from genuine electronic cigarette use. This includes the effects of the vapor at much higher volume and temperatures that are inhaled during regular use of these devices. The effects of inhaling the flavoring substances remain unknown. Born et al.(2015), also concluded that current research does not support the use of electronic cigarettes as a smoking cessation tool.

Weaver et al. (2017) obtained data for their study from a national probability survey of 6,051 U.S. adults that was conducted in August and September 2015. Of the 399 adult users of electronic delivery systems who were current smokers, 80.7% used nicotine. Other findings showed that 36.9% of electronic delivery system users who were never smokers reported using nicotine. While electronic cigarettes may be used with or without nicotine, 99% of electronic delivery system products sold in 2015 contained nicotine. The study estimated that a nontrivial 1.5 million never smokers are using electronic delivery systems with nicotine. Although research
suggests that most tobacco related mortality and morbidity is not directly related to nicotine, evidence shows that nicotine is addictive and harmful to both fetuses of pregnant women and adults with cardiovascular disease. The authors recommended further research which assesses the extent to which pregnant women and women of child bearing age are utilizing these electronic delivery systems with nicotine.

Rutten et al. (2015) conducted a survey in April and May 2014. Data was collected through a probability based web enabled panel survey developed by the authors and implemented by GfK (formerly Knowledge Networks). A total of 4,814 panel members profiled as current smokers were identified and asked to participate. There were 2,663 participants who completed the survey and were considered for use. Findings suggested that e-cigarette users were more likely to report an intention to quit smoking within 6 months than smokers who did not use e-cigarettes. Prior quit attempts and intention to quit were reported more often among e-cigarette users than non-users. In conclusion, nearly 25% of smokers in the study reported e-cigarette use as primarily motivated by intentions to quit or reduce smoking. These findings identify a clinical and public health opportunity to re-engage smokers in their cessation efforts. Therefore, a patient who inquires about electronic cigarette use and its ability to assist in smoking cessation may indicate an important milestone in their willingness to quit and ultimately their success in doing so.

Soule et al. (2016) conducted a study using an integrated, mixed method participatory research approach known as concept mapping in order to characterize and describe adults’ reasons for using electronic cigarettes. A total of 108 adults completed a multi-module online concept mapping study that consisted of categorizing statements about the participants’ reasons for e-cigarette use, sorting each statement into similar categories, and then rating them on their e-
cigarette use in the past month. There were 125 unique statements that were identified. Smoking cessation, perceived health benefits, private regard, convenience, and conscientiousness were rated significantly higher than other category types. While some responses were related to harm reduction and/or smoking cessation other reasons or categories suggest that electronic cigarette use was popular as a hobby, networking, and as a socializing opportunity. Nurse Practitioners should be aware that certain products may be geared toward different types of electronic cigarette users and may be marketed to appeal to these various types of users. As these types of devices continue to evolve, it is possible that future electronic cigarettes may be designed to appeal to specific consumers who are attracted to their use for reasons beyond smoking cessation.

**Summary**

Chapter 2 has presented a review of literature, findings and future research suggestions. Relevant tools, instruments, and methods were reviewed as well. Chapter 3 will describe the methodology and design of this study.
Chapter 3: Methodology

Chapter 3 will include a thorough review of the methodology utilized in this study. The study design, sampling method, human rights assurances, data collection methods, introduction of the tool, and data analysis will be addressed.

Research Design

A descriptive quantitative survey was employed as the design of the study. The modified Short Form Vaping Consequences Questionnaire (S-VCQ), (Morean & L’Insalata, 2017) was used as the tool to collect specific data such as demographic and outcome expectancies of current vapers. Data was collected via SurveyMonkey in an effort to reach a nationwide population of current electronic cigarette users age 50 years and older. Descriptive statistics were used to categorize and summarize the data in an effort to show outcome expectancies of the adult electronic cigarette user.

Sample and Setting

A convenience sample of a minimum of forty anonymous participants from those who met specific inclusion criteria were invited to participate in the study. The survey was posted to The National Vaping Network, an online network consisting of 10,000 members nationwide who currently vape. Inclusion criteria for the study included individuals who were 50 years of age or older, currently belong to the National Vaping Network, able to read and understand the English language, and be willing to complete the survey.

No incentive for completion of the survey was offered in exchange for their participation. This method was used in an effort to promote anonymous individual participation from a nationwide network of subjects, and encourage independent private online responses. The setting for this survey depended when and where the participant had internet access, and where they
chose to complete the survey. Participants’ utilized individual devices such as smart phone, electronic tablet, or computer to complete their online survey. No identifying data was collected by the researcher (i.e. name, IP address). There were no risks or benefits to the participant related to participating in the study.

Human Rights Protection

The study was reviewed and approved for a certification of exemption by the Human Subjects Research Review Committee at Daemen College (see Appendix A). Survey questionnaires were posted anonymously to participants via SurveyMonkey; therefore, subjects were not required to sign an informed consent for their participation in the study. No risk for participating in the study was assumed. The survey was placed on the closed/private nationwide vaping network, consisting of 10,000 members who currently use electronic cigarettes. Consent to utilize the National Vaping Network for recruitment was obtained by the network administrator. Participation was completely voluntary, and the participants were notified that that they could exit out of the survey prior to submission with no associated risk incurred if at any time they did not wish to partake in the study. Consent was assumed at completion of the survey and submission of data (See Appendix B). All surveys were submitted electronically with no identifying information revealed to the researcher.

Data Collection

The data for the study was collected from a survey utilizing the modified Short Form Vaping Consequences Questionnaire (S-VCQ) as well as specific demographic questions used by the researcher. The survey consisted of 29 items and was expected to take 10 to 15 minutes to complete. The survey was broken down into two separate categories. Part 1 contained eight demographic questions regarding; gender, age, ethnicity, location, current smoking status,
income and educational level. Part 2 contained 21 potential consequences which the participant was asked to rank their likelihood of personal agreement for each on a 10-point Likert scale: Zero indicating completely unlikely through nine indicating a completely likely consequence (See Appendix C).

Likert scales were used to survey the participants’ responses to 21 vaping consequences associated with taste and enjoyment (positive reinforcements), appetite/weight control, mood (negative reinforcement) and overall health (negative consequences). Negative consequences include such statements as “by smoking I risk heart disease and lung cancer”; and “the more I vape the more I risk my health”. Positive reinforcements are described as; “e-cigarettes taste good”; and “I enjoy the feeling of an e-cigarette on my tongue and lips”. Negative reinforcement is demonstrated in such statements as “vaping calms me down”, “e-cigarettes help me deal with anger”; and “e-cigarettes help me deal with anxiety or worry”. And, lastly appetite and weight control are demonstrated in such statements as “vaping controls my appetite”; and “e-cigarettes help me control my weight”.

The S-VCQ is not copyrighted and therefore free to use in future studies. Previous researchers encourage its use and have found it to be reliable and valid as a measure of vaping expectancies for use with adult e-cigarette users (Morean & L’Insalata, 2017). The survey was posted online to The National Vaping Network and data was collected over a four day period.

Data Analysis

Descriptive statistics were used to analyze the data. Data analysis was performed utilizing the Statistical Package for the Social Sciences (SPSS-23) and Survey Monkey to calculate and describe the results. Descriptive statistics were used to describe the sample, including demographic findings and the participants’ responses to statements about their vaping use. The
findings were reported in both written and visual form. Tables were utilized as a means to improve the understanding of the information obtained, as to show specific outcome expectancies of the adult vaper.

**Summary**

Chapter 3 included a description of the methodology used for this study. The research design, subjects, sample and the setting were also reviewed. The method and procedure for collecting the data was declared as well as information regarding protection of human subjects.
Chapter 4: Results

Chapter 4 will present the results of the quantitative study of adult electronic cigarette users’ expectancies—excluding demographic data and statements as they relate to taste, appetite, mood, enjoyment and overall health. Findings and statistical results will be presented in written documentation as well as table and graph format for improved interpretation of the results. The data was calculated and presented utilizing SurveyMonkey’s data analysis program and the Statistical Package for the Social Sciences (SPSS).

Demographics

A total of forty nine participants’ completed the survey which was collected over a four day period via SurveyMonkey. Five surveys were excluded due to the participants’ age of less than fifty years; therefore forty four surveys were utilized for the purpose of this research. Demographic data included gender, age, race, educational level completed, smoking status, region and income level. Eligible participants ranged in age from 50 to 65 years old, with a mean age of 55, modes of 55, and 57, and a median age of 59. Of the forty four participants, 63% (n=28) were female, and 36% (n=16) were male. Graph 1 below illustrates participants’ response by gender.

Graph 1: Participants gender
The majority of the participants \((n=42; 95\%)\) identified as being white and having at least a high school diploma/some college \((n=42)\). Graph 2 represents race/ethnicity in graphic form and Graph 3 shows the highest level of education of participants.

**Graph 2: Race/ethnicity**

Please describe your race/ethnicity.

**Graph 3: Educational level completed**

What is the highest level of education you have completed?

Answered: 43  Skipped: 1
Forty participants (~91%) stated that they were former smokers, while only one reported being a current non-daily smoker and three indicated that they were current daily smokers. Graph 4 illustrates the percentage of participants whom were former smokers, current non-daily smokers, or current daily smokers.

**Graph 4: Current Smoking Status**

Most participants were from the Northeast (n=28; 63.64 %) and earned between $50,000 and $79,999 (n=15; ~34%). Graph 5 displays participants’ responses to region and Graph 6 shows their income level by group.
Graph 5: Region

In which region of the United States do you live?
Answered: 44  Skipped: 0

Graph 6: Approximate Average Income

What is your approximate average income?
Answered: 44  Skipped: 0
Expectancy Findings

Likert scales were used to survey the participants’ responses to twenty-one vaping consequences associated with taste and enjoyment (positive reinforcements), appetite/weight control, mood (negative reinforcement) and overall health (negative consequences). The modified Short Form Vaping Consequences Questionnaire (S-VCQ) had three questions which can be grouped together under the taste category, and two questions which can be further divided into enjoyment and sensation. While both of these are considered positive reinforcement they are divided into two separate categories to assist with further understanding of the importance of each category in the individual vaper.

Results showed a strong association of vaping related to taste with 34.09% (n=15) of the respondents rating the highest score of completely likely that “vaping tastes good”. The other 43.19% (n=19) of the participants rated taste in some form of positive reinforcement as likely to contribute to their overall use of electronic cigarettes. For the expectancy “When I vape the taste is pleasant”, 32.56% (n=14) ranked the highest with completely likely, the other 67.44% (n=29) of the respondents again still ranked likely as a positive reinforcement towards their use of e-cigarettes. In response to the question of enjoying the flavor of an e-cigarette, 30.23% (n=13) stated that they were completely likely to enjoy the flavor of these devices. The other 39.53% (n=17) of the respondents still felt some form of likely as to their enjoyment towards flavor. A detailed breakdown of responses is presented in Table 1.
Table 1: Taste/Flavor

(*positive reinforcements)

<table>
<thead>
<tr>
<th></th>
<th>Vaping tastes good (n=44)</th>
<th>When I vape the taste is pleasant (n=43)</th>
<th>I will enjoy the flavor of an e-cigarette (n=43)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely Likely</td>
<td>15 (34.1%)</td>
<td>14 (32.6%)</td>
<td>13 (30.2%)</td>
</tr>
<tr>
<td>Extremely Likely</td>
<td>10 (22.7%)</td>
<td>9 (20.1%)</td>
<td>8 (18.6%)</td>
</tr>
<tr>
<td>Very Likely</td>
<td>8 (18.2%)</td>
<td>11 (25.6%)</td>
<td>13 (30.2%)</td>
</tr>
<tr>
<td>Somewhat Likely</td>
<td>10 (22.7%)</td>
<td>8 (18.6%)</td>
<td>6 (14.0%)</td>
</tr>
<tr>
<td>A Little Likely</td>
<td>1 (2.3%)</td>
<td>1 (2.3%)</td>
<td>2 (4.7%)</td>
</tr>
<tr>
<td>A Little Unlikely</td>
<td>0</td>
<td>0</td>
<td>1 (2.3%)</td>
</tr>
<tr>
<td>Somewhat Unlikely</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Very Unlikely</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Extremely Unlikely</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Completely Unlikely</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Enjoyment of the device was identified by two questions. “I enjoy the taste sensation while vaping” reported 29.55% (n=13) completely likely, with the other 50% (n=22) of the participants stating that they were likely to enjoy taste and sensation of electronic cigarettes. Only 4.54% (n=2) felt that they were unlikely to enjoy the taste and sensation. For the statement- “I will enjoy the feeling of an electronic cigarette on my tongue and lips”, 31.82% (n=14) reported very likely, while the remainder or 61.36% (n=27) still chose some form of likely at enjoying taste and sensation. Only 3 participants or 6.81% were unlikely to agree with that statement. Table 4 displays respondents’ results as they relate to sensation and enjoyment.
Table 2: Sensation/Enjoyment
(*positive reinforcements)

<table>
<thead>
<tr>
<th></th>
<th>I enjoy the taste sensation while vaping (n=44)</th>
<th>I will enjoy an e-cig on my tongue and lips (n=44)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely Likely</td>
<td>13 (29.5%)</td>
<td>5 (11.4%)</td>
</tr>
<tr>
<td>Extremely Likely</td>
<td>8 (18.2%)</td>
<td>2 (4.5%)</td>
</tr>
<tr>
<td>Very Likely</td>
<td>10 (22.7%)</td>
<td>14 (31.2%)</td>
</tr>
<tr>
<td>Somewhat Likely</td>
<td>8 (18.2%)</td>
<td>13 (29.5%)</td>
</tr>
<tr>
<td>A Little Likely</td>
<td>3 (6.8%)</td>
<td>7 (15.9%)</td>
</tr>
<tr>
<td>A Little Unlikely</td>
<td>1 (2.3%)</td>
<td>1 (2.3%)</td>
</tr>
<tr>
<td>Somewhat Unlikely</td>
<td>1 (2.3%)</td>
<td>0</td>
</tr>
<tr>
<td>Very Unlikely</td>
<td>0</td>
<td>1 (2.3%)</td>
</tr>
<tr>
<td>Extremely Unlikely</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Completely Unlikely</td>
<td>0</td>
<td>1 (2.3%)</td>
</tr>
</tbody>
</table>

The modified S-VCQ asked five questions related to appetite and weight management. For the question “vaping controls my appetite”; 22.73% (n=10) state that vaping is somewhat likely to control their appetite. While, 18.18% (n=8) reported this as very unlikely; and 15.91% (n=7) a little likely. The results were more widely varied from participants for this consequence. Results from the question “vaping helps me control my weight” the results were divided with 20.45% (n=9) respondents choosing very unlikely, while 18.18% (n=8) felt a little likely that vaping helped control their weight.
Results from the question “E-cigarettes keep me from eating more than I should,” the highest score demonstrated 18.6% (n=8) as somewhat unlikely. The remaining frequencies again were scattered across the table. Results from the question “vaping keeps my weight down” demonstrated a majority of 21.43% (n=9) as very unlikely. See Table 3 for remaining results associated with appetite and weight management.

Table 3: Appetite/Weight Management

(*appetite/weight control)

<table>
<thead>
<tr>
<th></th>
<th>Vaping controls my appetite (n=44)</th>
<th>E-cigarettes keep me from overeating (n=43)</th>
<th>Vaping helps me control my weight (n=44)</th>
<th>E-cigarettes keep me from eating more than I should (n=43)</th>
<th>Vaping keeps my weight down (n=42)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely Likely</td>
<td>1 (2.3%)</td>
<td>1 (2.3%)</td>
<td>2 (4.5%)</td>
<td>1 (2.3%)</td>
<td>1 (2.4%)</td>
</tr>
<tr>
<td>Extremely Likely</td>
<td>1 (2.3%)</td>
<td>2 (4.7%)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Very Likely</td>
<td>3 (6.8%)</td>
<td>3 (7.0%)</td>
<td>1 (2.3%)</td>
<td>3 (7.0%)</td>
<td>2 (4.8%)</td>
</tr>
<tr>
<td>Somewhat Likely</td>
<td>10 (22.7%)</td>
<td>5 (11.6%)</td>
<td>5 (11.4%)</td>
<td>6 (14.0%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>A Little Likely</td>
<td>7 (15.9%)</td>
<td>7 (16.3%)</td>
<td>8 (18.2%)</td>
<td>6 (14.0%)</td>
<td>6 (14.3%)</td>
</tr>
<tr>
<td>A Little Unlikely</td>
<td>4 (9.1%)</td>
<td>5 (11.6%)</td>
<td>5 (11.4%)</td>
<td>5 (11.6%)</td>
<td>6 (14.3%)</td>
</tr>
<tr>
<td>Somewhat Unlikely</td>
<td>2 (4.5%)</td>
<td>5 (11.6%)</td>
<td>7 (15.9%)</td>
<td>8 (18.6%)</td>
<td>4 (9.5%)</td>
</tr>
<tr>
<td>Very Unlikely</td>
<td>8 (18.2%)</td>
<td>6 (14.0%)</td>
<td>9 (20.5%)</td>
<td>6 (14.0%)</td>
<td>9 (21.4%)</td>
</tr>
<tr>
<td>Extremely Unlikely</td>
<td>2 (4.5%)</td>
<td>3 (7.0%)</td>
<td>2 (4.5%)</td>
<td>1 (2.3%)</td>
<td>2 (4.4%)</td>
</tr>
<tr>
<td>Completely Unlikely</td>
<td>6 (13.6%)</td>
<td>6 (14.0%)</td>
<td>5 (11.4%)</td>
<td>7 (16.3%)</td>
<td>7 (16.7%)</td>
</tr>
</tbody>
</table>

Questions pertaining to mood/emotion or negative reinforcement are repeated in seven questions throughout the survey “E-cigarettes help me deal with anxiety or worry” reported a
majority of 27.27% (n=12) and 25% (n=11) as somewhat likely and very likely respectively. Only 9.09% (n=4) reported somewhat unlikely. “Vaping helps me deal with depression” most frequent results demonstrated 20.93% (n=9) as a little likely, 13.95% (n=6) as both a little unlikely and somewhat likely. The remaining frequencies again were more diverse throughout the table.

Expectancies for dealing with anger were reported as a little likely at 20.93% (n=9) and 11.63% (n=5) very unlikely. Expectancies for reducing tension showed the majority of responses or 81.8% (n=36) as some form of likely, that vaping would assist them with decreasing tension.

“An e-cigarette helps me cope” expectancies were: 81.18% or 36 of the 44 participants felt that an e-cigarette helped them cope when they were upset. “Vaping calms me down” results showed 83.33% or 35 of the participants were likely to associate using their e-cigarette as a way to assist in their negative mood. “When I’m angry an e-cigarette can calm me down” reported the majority of participants’ felt likely that this statement was true with high frequencies reported.

See Table 4 for the participants responses associated with mood and emotion.
### Table 4: Mood/Emotion

(* negative reinforcement)

<table>
<thead>
<tr>
<th></th>
<th>E-cig help me deal with anxiety/worry (n=44)</th>
<th>Vaping helps me deal with depression (n=43)</th>
<th>E-cig help me deal with anger (n=43)</th>
<th>E-cig help me reduce or handle tension (n=44)</th>
<th>When I’m upset with someone an e-cig helps me cope (n=44)</th>
<th>Vaping calms me down when I feel nervous (n=42)</th>
<th>When I’m angry an e-cig can calm me down (n=43)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely Likely</td>
<td>6 (13.6%)</td>
<td>1 (2.3%)</td>
<td>1 (2.3%)</td>
<td>4 (9.1%)</td>
<td>4 (9.1%)</td>
<td>3 (7.1%)</td>
<td>3 (7.0%)</td>
</tr>
<tr>
<td>Extremely Likely</td>
<td>4 (9.1%)</td>
<td>3 (7.0%)</td>
<td>3 (7.0%)</td>
<td>11 (25%)</td>
<td>11 (25%)</td>
<td>7 (15.9%)</td>
<td>3 (7.0%)</td>
</tr>
<tr>
<td>Very Likely</td>
<td>11 (25%)</td>
<td>3 (7.0%)</td>
<td>3 (7.0%)</td>
<td>12 (27.3%)</td>
<td>12 (27.3%)</td>
<td>8 (19.0%)</td>
<td>5 (11.6%)</td>
</tr>
<tr>
<td>Somewhat Likely</td>
<td>12 (27.3%)</td>
<td>6 (14.0%)</td>
<td>8 (18.6%)</td>
<td>12 (27.3%)</td>
<td>14 (33.3%)</td>
<td>14 (33.3%)</td>
<td>9 (20.9%)</td>
</tr>
<tr>
<td>A Little Likely</td>
<td>4 (9.1%)</td>
<td>9 (20.1%)</td>
<td>6 (18.6%)</td>
<td>9 (13.6%)</td>
<td>11 (25%)</td>
<td>6 (13.6%)</td>
<td>15 (34.9%)</td>
</tr>
<tr>
<td>A Little Unlikely</td>
<td>2 (2.3%)</td>
<td>14 (33.3%)</td>
<td>4 (9.3%)</td>
<td>6 (13.6%)</td>
<td>3 (6.8%)</td>
<td>2 (4.8%)</td>
<td>2 (4.7%)</td>
</tr>
<tr>
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<td>5 (11.6%)</td>
<td>3 (7.0%)</td>
<td>9 (11.6%)</td>
<td>2 (4.5%)</td>
<td>2 (4.8%)</td>
<td>2 (4.7%)</td>
</tr>
<tr>
<td>Very Unlikely</td>
<td>1 (2.3%)</td>
<td>5 (11.6%)</td>
<td>5 (11.6%)</td>
<td>2 (4.5%)</td>
<td>1 (2.3%)</td>
<td>1 (2.4%)</td>
<td>1 (2.3%)</td>
</tr>
<tr>
<td>Extremely Unlikely</td>
<td>0</td>
<td>4 (9.3%)</td>
<td>3 (7.0%)</td>
<td>-</td>
<td>1 (2.3%)</td>
<td>1 (2.4%)</td>
<td>1 (2.3%)</td>
</tr>
<tr>
<td>Completely Unlikely</td>
<td>0</td>
<td>3 (7.0%)</td>
<td>1 (2.3%)</td>
<td>1 (2.3%)</td>
<td>1 (2.4%)</td>
<td>1 (2.4%)</td>
<td>2 (4.7%)</td>
</tr>
</tbody>
</table>

Four questions were categorized into overall health and wellness, considered negative consequences. “By vaping I risk heart disease and lung cancer” expectancies reported as follows: 20.45% (n=9) felt that they were completely unlikely to risk heart disease and lung cancer by vaping, while 18.18% (n=8) as a little likely, in their response. “The more I vape the more I risk
my health” expectancies were; 25.58% (n=11) reported feeling *a little likely* as to risking their overall health by vaping, while 23.26% (n=10) as *completely unlikely*. “Vaping is hazardous to my health” results demonstrated 29.55% (n=13) as vaping was *a little likely* to be hazardous to their health, and 18.18% (n=8) felt *very unlikely* that vaping was hazardous to their health. “Vaping is taking years off of my life” expectancies reported as follows: 20.45% (n=9) felt *completely unlikely* and *extremely unlikely* that vaping was taking years off of their life. While 15.91% (n=7) felt *a little likely* that vaping would have negative effects on their overall years of life. See Table 5 for frequency of results reported by participants in the overall health category.
### Table 5: Overall Health

(* negative consequences)

<table>
<thead>
<tr>
<th></th>
<th>By vaping I risk heart disease and lung cancer (n=44)</th>
<th>The more I vape the more I risk my health (n=43)</th>
<th>Vaping is hazardous to my health (n=44)</th>
<th>Vaping is taking years off of my life (n=44)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely Likely</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Extremely Likely</td>
<td>0</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Very Likely</td>
<td>3 (6.8%)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Somewhat Likely</td>
<td>3 (6.8%)</td>
<td>5 (11.6%)</td>
<td>3 (6.8%)</td>
<td>2 (4.5%)</td>
</tr>
<tr>
<td>A Little Likely</td>
<td>8 (18.1%)</td>
<td>11 (25.6%)</td>
<td>13 (29.5%)</td>
<td>7 (15.9%)</td>
</tr>
<tr>
<td>A Little Unlikely</td>
<td>4 (9.1%)</td>
<td>1 (2.3%)</td>
<td>3 (6.8%)</td>
<td>6 (13.6%)</td>
</tr>
<tr>
<td>Somewhat Unlikely</td>
<td>6 (13.6%)</td>
<td>8 (18.6%)</td>
<td>5 (11.3%)</td>
<td>3 (6.8%)</td>
</tr>
<tr>
<td>Very Unlikely</td>
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<td>5 (11.6%)</td>
<td>8 (18.1%)</td>
<td>8 (18.1%)</td>
</tr>
<tr>
<td>Extremely Unlikely</td>
<td>3 (6.8%)</td>
<td>3 (7.0%)</td>
<td>5 (11.3%)</td>
<td>9 (20.5%)</td>
</tr>
<tr>
<td>Completely Unlikely</td>
<td>9 (20.5%)</td>
<td>10 (23.3%)</td>
<td>7 (15.9%)</td>
<td>9 (20.5%)</td>
</tr>
</tbody>
</table>

### Summary of Expectancies

Adults ages fifty and older rated that flavor/taste was extremely likely for their use of electronic cigarettes. Over 97% of the participants’ stated that taste was a very good likely
consequence of vaping. Appetite and weight expectancies were varied. There were approximately 40% of the participants who reported that vaping had at least some effect on their weight control and appetite and approximately 60% of participants felt that vaping did not affect their appetite or weight control. Many participants (72%) felt likely that an e-cigarette helped them control tension, anger or depression, with many responses scoring over 80%. Enjoyment and sensation were highly rated with participants as being strongly likely (95.4%) to report that they enjoyed the taste and sensation of vaping. The majority of the participants (92.5%) demonstrated a preference associated with taste and the feeling of an electronic cigarette on their tongue and lips. Of the forty four participants, 45% felt a little likely that vaping risked their overall health verses 54% stating that vaping was unlikely to risk their health. Interestingly, the scores were approximately 65% unlikely that vaping had any negative association with health until the final question: ‘vaping is taking years off of my life’, an overwhelming majority, (79.5%) stated that as an unlikely consequence.

Summary

Chapter 4 presented the results obtained from the quantitative descriptive study in narrative and chart form. Demographics and statements describing adult vaping expectancies were presented in this chapter. A discussion of the results, limitations, implications for practice, recommendations for future studies and final conclusion will be presented in Chapter 5.
Chapter 5: Discussion

Chapter 5 will discuss an overview of the study, findings, limitations, implications for practice, recommendations for further research and conclusions of the study.

Overview of the Study

The purpose of this study was to identify and expand on existing research regarding vaping expectancies of the adult (age 50 years and older) electronic cigarette user. While research is limited due to the newness of these alternative electronic smoking devices, much current literature is available that pertains to this rapidly growing phenomenon in children and young adults. Research has demonstrated that children and young adults may have never tried a conventional cigarette (McMillen, et.al, 2015) while adults over the age of fifty are identifying with these devices as a means to successfully quit smoking as they believe that e-cigarettes are a healthier alternative to their smoking practices (Chapman & Wu, 2015). While the majority of adults most often reported using e-cigarettes as a substitute for tobacco, their motives may not always be to quit smoking, but rather improve the convenience of their nicotine addiction (Chapman & Wu, 2014). How these devices are perceived for use; convenience, cost and, health benefits, is directly related to their overall marketing. Interestingly, while not examined in this survey, other researchers have shown a correlation of vaping with in certain degrees of socialization and networking of the individual (Soule, et al., 2016).

The theoretical framework used to guide this study was Dorothea Orem’s Theory of Self-Care and Self-Care Deficits. By properly identifying the point where patients seek out care within their own self-care deficit, the Nurse Practitioner can play a key role in the health promotion of their clients, with a successful smoking cessation program (Williams-Utz, et.al,
Therefore, primary care healthcare providers must screen clients’ current smoking/vaping status, including those patients who are considered dual users.

A literature review provided current information regarding smoking and vaping including prevalence, cost, burden and expectancies associated with the adult electronic cigarette user. A tool to measure vaping expectancies was borrowed and approved for use within this study. The modified Short Form Vaping Consequences Questionnaire (S-VCQ; Morean & L’Insalata, 2017) was utilized to assess participants’ perceived likelihood of consequences ranked on a ten item Likert scale. Data for the study were collected from an anonymous sample of forty four participants. Survey Monkey was used to place the study on “The National Vaping Network”, to improve overall participation of those who met specific age and vaping criteria. Demographic findings and the total frequency of responses associated with the consequence questionnaire were then calculated and presented.

**Discussion of Findings**

A total of 49 participants replied to the survey over a four-day period; and 44 surveys were utilized for data analysis. Five surveys were discarded due to not meeting the age criteria for the current study. Overall, the findings of this survey complement what is seen within current published literature.

Demographic findings indicated that there were more Caucasians/whites in this study, which compares to current research trends showing that more Caucasians vape compared to other ethnicities (Delnevo et al., 2016). More women than men responded to the survey questionnaire, contradicting current literature which shows that more men vape compared to women (McMillen, et.al, 2015). However, women are more likely than men to have experimented with an electronic cigarette (Al-Delaimy et al., 2015). Most participants in this
In line with Born et al.’s (2015) study, findings suggest that former adult smokers used vaping as a means to quit smoking, with the majority (90%) of the participants in this study considering themselves former smokers. In the study conducted by Chapman and Wu (2015), adults were asked if they used e-cigarettes the same as conventional cigarettes, with the majority responding yes, but reported that they actually used an e-cigarette more often. This finding may be associated with increasing nicotine addiction rather than assisting with smoking cessation. Findings in this study also demonstrate an upward trend related to dual smoking status, which compares to work by previous researchers (McMillen et al., 2015). While this study did not distinguish the amount or times of vaping throughout the day, findings imply a likely correlation between former smokers and vaping, and the slight increase in dual users associated with those that vape.

In a study conducted by Nelson et al. (2015), demographic data further revealed that e-cigarette users were most likely to be former smokers, who smoked an average of twenty years, were married or cohabitating with another individual, and had greater nicotine consumption, expanding on the known characteristics of adult electronic cigarette users. While this study found that over 90% of the participants were former smokers, further research is needed in determining the degree of use as it is associated with cohabitation and second hand smoke.
Consistent with prior research on vaping, most adult e-cigarette users in this study identified taste/flavor (a positive reinforcement) with their current use, which, according to Morean and L’Insalata (2017) may be associated with e-cigarettes coming in a variety of alluring flavors. All respondents in this study scored a degree of likely to the three statements pertaining to taste/flavor (Refer to Table 1, Taste/flavor considered positive reinforcement); with almost all claiming that they enjoy the taste and flavor of an e-cigarette.

When referring to the two questions related to sensation and enjoyment (See results listed in Table 2, also considered to be a positive reinforcement), an overwhelming majority of participants strongly identified vaping as overall enjoyable with a positive sensation of vaping on their tongue and lips. Morean and Wedel (2017) raised concerns in their study that while vaping was shown to correlate with overall taste, enjoyment, mood and appetite; these were unsubstantiated uses of these devices, as revealed by the participants. In other words, were individuals vaping because they were former smokers, addicted to nicotine or were they vaping to decrease their appetite, calm their nerves, enhance their mood, or any other consequence that smokers may have associated with nicotine over the years, though not specifically expressed in advertisements or marketed as such.

Responses to items pertaining to tension, anger and depression (see results shown in Table 4, dealing with statements regarding Mood/Emotion; considered negative reinforcements) showed that most participants believed vaping assisted them with their emotions. This finding is not consistent with other researchers’ findings, however Morean and L’Insalata (2017) state that tension, anxiety and worry are associated with nicotine withdrawal symptoms and therefore may affect the self-report frequency of this item. Questions remain regarding electronic cigarette
users’ vaping frequency as it relates to mood/emotion or as it is associated with specific withdrawal symptoms.

Research has shown a strong relationship between vaping and appetite (Morean & L’Insalata, 2017); however the majority of participants in this study contradicted this finding. The participants in this study were more unlikely to believe that vaping affected their appetite and/or controlled their weight (refer to Table 4; Appetite/Weight Management, considered under the appetite/weight control subscale).

While overall use is highly associated with former smoking, individuals revealed that there are direct correlations for flavor, sensation, mood, and appetite and weight control in their current vaping use. Higher response frequencies may suggest a stronger affiliation within those specific categories. Other data suggest that while these former smokers reveal strong correlations which add to their vaping prevalence (such as taste, flavor, and enjoyment) the majority or 54%, also believe that vaping is unlikely to negatively affect their overall health (refer to questions regarding overall health as seen in Table 5 which is considered under the negative consequences subscale). Therefore, not only are former smokers drawn to vaping for flavor, nicotine, taste, enjoyment but overall they believe that they are not negatively harming their overall health. They perceive vaping as a healthier alternative than smoking. Further research is needed in addressing the short and long term effects of these new nicotine delivery systems. While adults may look to these new devices to aid in their reduction of conventional cigarette use, research is lacking on comparing e-cigarettes with standard therapies, such as the nicotine patch, gum or inhaler (Kalkhoran & Glantz, 2016).
Limitations

Limitations of the study include the small sample size and limited accessibility to the survey questionnaire which decreases generalizability of study findings. The survey was posted to only one on-line web site, for a total of four days. Other limitations include the self-report on-line survey methodology employed for data collection, which assumes that participants answer honestly and to only one questionnaire. The ten-item Likert scale may also be considered a limitation, in that the categories are similar in their response; for instance *completely likely*, *extremely likely*, *somewhat likely*, *very likely*, *a little likely*, and may be cumbersome for the participant to utilize. Lastly, the inexperience of the researcher in conducting the study may also be considered a limitation; although the student researcher worked with an experienced faculty researcher.

Implications for Practice

Dorothea Orem’s Self-Care Deficit theory was used in this study to guide and examine specific individual descriptive variables in smoking cessation that individuals displayed which may have led to their success in ending their smoking habit. In the study conducted by Williams-Utz, Shuster, Merwin, and Williams (1994), results showed that nicotine addiction was markedly associated with those individuals whom were unable to quit smoking. It was suggested that patients operating within their own self-care continuum may seek out these new devices as a means to quit smoking and/or seek out the assistance of the Nurse Practitioner. The Nurse Practitioner must remain attentive to the individual patient who seeks out questions or guidance regarding their smoking habit, and address their needs accordingly. Quit attempts may not always be successful but support, encouragement and guidance should be offered at each visit.
Knowledge regarding the long term health effects of electronic cigarettes is scare due to their rapidly evolving use. Overall, standards and government regulations for e-cigarettes are also considered inadequate due to the limited time in which they have been available. Results from this study indicate that an overwhelming majority of adults who use electronic cigarettes are former smokers whom initiated e-cigarettes as a means to stop smoking. Surprisingly, the majority of the participants believed that they are not negatively influencing their health by utilizing these new devices. Contrary to the findings, current research does not support the use of e-cigarettes as a smoking cessation tool (Born, et. al., 2015). Data demonstrating decreased harm associated with long term vaping remains inconclusive (Zborovskaya, 2016). Thus, it is strongly recommended that clinicians discourage vaping and educate patients on the negative health effects and unknown consequences of vaping. Further, clinicians should clearly refer to vaping as smoking; not a healthy substitute or means of smoking cessation.

The potential impact on public health remains unknown. Therefore the Nurse Practitioner must continue to study and become knowledgeable in the factors that influence clients’ smoking/vaping behaviors, including: taste/flavor, appetite/weight loss, mood/emotion and taste/sensation. Healthcare providers must recognize smokers/vapers and dual users, in an attempt to properly diagnosis and treat this specific patient population. Further research will assist healthcare providers in developing the skills needed to recognize those individuals whom were former smokers, vapers or dual users. Healthcare providers need a better understanding of adult electronic cigarette users and their various motivating reasons for continuing their nicotine addiction.

Nicotine delivery systems will continue to evolve and the Nurse Practitioner must remain cognizant in current trends, which directly affect their patients. The Nurse Practitioner
must ultimately use evidence based practice guidelines in order to educate and assist clients towards successful smoking cessation strategies in an attempt to improve their clients overall health.

**Recommendations for Future Research**

It is recommended that this research be replicated using a larger sample size to improve generalizability. Further research inclusive of larger sample sizes is needed to assess the use and expectancies of adult smokers utilizing these new electronic cigarettes. Another recommendation is to compare adult e-cigarette users from different demographic backgrounds, including different settings, smoking statuses, and explore gender differences between men and women. It is further suggested that other expectancies of vaping that were not evaluated within this research study (such as cost, portability, ease of use, acceptance, socializing, networking and overall nicotine addiction) be further researched, particularly in the adult population.

Further research on the relationship between smoking and vaping in the adult population is needed including prior quit attempts, intentions to quit, and vaping frequency. Research involving overall long term health risks associated with electronic cigarette use is needed to assist Nurse Practitioners so they may properly educate their patients and support them to increase success in their smoking cessation attempts.

**Conclusion**

While prevalence of electronic cigarettes continues to increase, further research is needed regarding the associated health risks linked to both short and long term effects of these new smokeless devices. Until healthcare providers can offer their clients evidenced based studies, former smokers, in an attempt towards a healthier alternative may look to these new nicotine delivery systems as a smoking cessation tool. This study focused on the adult (age fifty years and
older) e-cigarette user expectancies. While sample size was small, results parallel that of current research. Limited data were obtained in this study, however, results offer the Nurse Practitioner a deeper understanding of the multi-faceted reasons in which former smokers choose these new nicotine delivery devices in their attempt to quit smoking.

Primary care Nurse Practitioners’ main goal is to coordinate care based on the patients’ needs and preferences. Excellent communication skills, up to date research and a trusting relationship with the patient will ultimately improve patient outcomes. Recognizing patients’ needs and addressing their health history properly will assist the healthcare provider in educating for improved health promotion, and successful smoking cessation. Thus, Nurse Practitioners must stay abreast of current trends in order to assist their clients with new strategies that improve overall health.
References


Appendix A

IRB APPROVAL

Protocol Title: Expectancies of Adult Electronic Cigarette User, Age 50 and Older
Protocol Approval Date: 09 April 2018

Dear Dr. Ball and Ms. Jacobs,

The Daemen College Human Subjects Research Review Committee (HSRRC) has approved your protocol for the study referenced above for a Certification of Exemption. Your protocol may commence immediately.

HSRRC approval is given with the understanding that no changes may be made in the procedures to be followed nor any study materials to be used until such modifications have been submitted to the HSRRC for review and have been given approval. Since your protocol is certified as an exempt protocol, however, it has no expiration date.

At the conclusion of the study, a Study Closure Form should be sent to the chairperson of the HSRRC at hsrrc.chair@daemen.edu.

For the record, the protocol as approved is attached to this message. Should the need arise for future correspondence regarding this study, please refer to the protocol ID noted above and on the approved protocol.

On behalf of the Committee, best of luck as you move forward with your research.

Regards,
Jennifer L. Scheid, Ph.D, CSCS
Chair, Human Subjects Committee
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Ph. 716 839-7656

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Appendix B

Description
As a Graduate student in the Nurse Practitioner program at Daemen College I am conducting a research study assessing vaping expectancies in the adult population (age 50 years and older) entitled “Expectancies of the Adult Electronic Cigarette user, age 50 years and older”. I am looking for participants to take an anonymous survey consisting of 29 questions that will take approximately 10 minutes to complete. Questions include a mix of demographic questions and questions about your perspectives on vaping.

Inclusion Criteria
Participants for this study must be 50 years of age or older, currently use e-cigarettes, and be able to read and understand English.

Risks/Benefits
Participation in the survey is anonymous and voluntary, and IP addresses are not being collected. The results will be presented within a collective form and without any identifying information. There are no anticipated risks or benefits to you related to participating in this survey.

Consent
Completing and submitting the survey will imply your consent. If you do not wish to participate in this survey, you can close the page at any time prior to completion. You have the right to refuse participation within the study simply by clicking out of the survey window at any time.

Contact Information
If you have any questions or concerns, please contact me at annmarie.jacobs@daemen.edu, or my thesis chairperson Dr. Lisa Ball at lisa.ball@daemen.edu. For concerns about your rights as a research participant, you can contact the Human Subjects Research Review Committee at Daemen College (hsrrc.chair@daemen.edu) by which this study was approved via an exempt certification.

Thank you for considering participation in this survey,
Appendix C

**VAPING QUESTIONNAIRE**

Part 1:

Check the appropriate box which most closely describes you.

1.) **Sex:**
   - Male
   - Female

2.) **Age:** _______years

3.) **Race:**
   - White
   - Black
   - Latino
   - Asian
   - Other

4.) **Highest Educational level completed:**
   - Less than high school
   - High school graduate
   - Some college
   - College Degree
   - Graduate degree or professional school
5.) **Current tobacco Cigarette Smoking Status:**

- Never Smoked
- Former Smoker
- Current Nondaily smoker
- Current daily smoker

6.) **Region:**

- Northeast
- Midwest
- South
- West

7.) **Income:**

- Less than 20,000
- 20,000 to 49,999
- 50,000 to 79,999
- 80,000 to 124,999
- 125,000 to 149,999
- 150,000 to 199,999
- 200,000 or greater

8.) **Did you start using e-cigarettes to help you quit smoking regular cigarettes?**

    Circle: Yes or no
Part 2:

Below is a list of statements about vaping. Each statement contains a possible consequence of vaping. For each of the statements below, please rate how LIKELY or UNLIKELY you believe each consequence is for you when you vape.

Please indicate your answer to each question using the scale below.

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<th>1</th>
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<tr>
<td>Completely Unlikely</td>
<td>Extremely Unlikely</td>
<td>Very Unlikely</td>
<td>Somewhat Unlikely</td>
<td>A little Unlikely</td>
<td>Likely</td>
<td>Somewhat Likely</td>
<td>Very Likely</td>
<td>Extremely Likely</td>
<td>Completely Likely</td>
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1. Vaping tastes good. 0 1 2 3 4 5 6 7 8 9
2. Vaping controls my appetite. 0 1 2 3 4 5 6 7 8 9
3. E-cigarettes help me deal with anxiety or worry. 0 1 2 3 4 5 6 7 8 9
4. I enjoy the tastes sensations while vaping. 0 1 2 3 4 5 6 7 8 9
5. Vaping helps me deal with depression. 0 1 2 3 4 5 6 7 8 9
6. E-cigarettes keep me from overeating. 0 1 2 3 4 5 6 7 8 9
7. E-cigarettes help me deal with anger. 0 1 2 3 4 5 6 7 8 9
8. When I vape the taste is pleasant. 0 1 2 3 4 5 6 7 8 9
9. I will enjoy the flavor of an e-cigarette. 0 1 2 3 4 5 6 7 8 9
10. I will enjoy feeling an e-cigarette on my tongue and lips. 0 1 2 3 4 5 6 7 8 9
11. By vaping I risk heart disease and lung cancer. 0 1 2 3 4 5 6 7 8 9
12. E-cigarettes help me reduce or handle tension. 0 1 2 3 4 5 6 7 8 9
13. Vaping helps me control my weight. 0 1 2 3 4 5 6 7 8 9
14. When I’m upset with someone, an e-cigarette helps me cope. 0 1 2 3 4 5 6 7 8 9
15. The more I vape, the more I risk my health. 0 1 2 3 4 5 6 7 8 9
Please indicate your answer to each question using the scale below.

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<th>Question</th>
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<td>16. E-cigarettes keep me from eating more than I should.</td>
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<td>17. Vaping keeps my weight down.</td>
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<td>18. Vaping is hazardous to my health.</td>
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<td>19. Vaping calms me down when I feel nervous.</td>
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<td>20. When I’m angry an e-cigarette can calm me down.</td>
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<td>21. Vaping is taking years off my life.</td>
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Thank you for your participation in this study.