Summer 8-9-2021

Exploring and understanding the culture of young adults who vape: A focused Ethnography

Beth Tremblay

EXPLORING AND UNDERSTANDING THE CULTURE OF YOUNG ADULTS WHO VAPE: A FOCUSED ETHNOGRAPHY

A Dissertation

Submitted to the School of Nursing

Duquesne University

In partial fulfillment of the requirements for

the degree of Doctor of Philosophy

By

Beth Tremblay

August 2021

EXPLORING AND UNDERSTANDING THE CULTURE OF YOUNG ADULTS WHO VAPE: A FOCUSED ETHNOGRAPHY

By

Beth Tremblay

Approved June 17, 2021

Melanie Turk, PhD RN Associate Professor of Nursing (Committee Chair)	Richard Zoucha, PhD, PMHCNS-BC, CTN-A, FAAN Professor of Nursing Chair of Advanced Role and PhD Program (Committee Member)
Maria Cooper PhD (External Committee Member)	Mary Ellen Glasgow, PhD, RN, ANEF, FAAN Dean, School of Nursing Professor of Nursing

ABSTRACT

EXPLORING AND UNDERSTANDING THE CULTURE OF YOUNG ADULTS WHO VAPE: A FOCUSED ETHNOGRAPHY

By

Beth Tremblay

August 2021

Dissertation supervised by Dr. Melanie Turk

Introduction: Vaping, the act of inhaling an aerosolized liquid, is associated with health risks. The 18- to 25-year-old age group has the highest rate of vaping among adults. Understanding culturally held values, beliefs, and experiences associated with the behavior of vaping in young adults may uncover the social mechanisms that underpin vaping initiation and influence continued use. The purpose of this study was to explore and understand the cultural values and beliefs about vaping among young adults. Method: The method used for this study was a focused ethnography. Young adults who currently vape nicotine (N=24) were recruited via snowball method and self-referral. . Semi-structured interviews were conducted via audio-recording and Zoom online video recording and transcribed into NVivo 12 software. Leininger's four phases of qualitative data analysis guided the concurrent data collection and analysis. Data were collected and

analyzed until saturation of data occurred. Results: Twenty-four categories and seven patterns were identified; subsequently three themes emerged from the data: 1) Individual and group values influence how vapers engage in community, 2) Vapers identify a scope of health effects, concerns, and nicotine addiction, 3) Vaping is a mechanism for self-calming and coping with internal and external pressures. Discussion: This study indicated a culture of vaping among young adults with its own beliefs, values, shared language, and norms. Implications of this study suggest that understanding cultural cues that influence behavior is critical to culturally competent care at primary and population levels. Culturally congruent interventions at primary, secondary, and tertiary levels are necessary to curb use.

DEDICATION

This work is dedicated to my husband, Sean. Your support through the years made all the difference.

ACKNOWLEDGEMENT

This study was made possible through a generous grant from Sigma Theta Tau Epsilon Phi Chapter. I am grateful to the participants for their introspection and sharing their experiences. I would like to personally thank my dissertation committee members, Drs. Melanie Turk, Richard Zoucha, and Maria Cooper for their wisdom and guidance.

TABLE OF CONTENTS

Page

LIST OF TABLES

Page

1.0 INTEGRATIVE REVIEW OF THE LITERATURE

Manuscript #1

Integrative Review of the Literature

Tremblay, B., Turk, M. T., Cooper, M. R., & Zoucha, R. (2020). Knowledge, Attitudes, and Perceptions of Young Adults About Electronic Nicotine Delivery Systems in the United States: An Integrative Review. *The Journal of Cardiovascular Nursing*, doi: 10.1097/JCN.0000000000000731

Abstract

Background: The causal link between cigarettes and cardiovascular disease is well known. The long-term effects of e-cigarettes are yet unknown, although early studies show biomarkers indicating inflammation and damage to endothelial cells associated with later development of cardiovascular disease. With the rapid rise in e-cigarette use, especially in young adults, it is imperative that health professionals understand the knowledge, perceptions, and motivations for use among young adults. Objectives: The purpose of this integrative review is to explore existing literature on young adults' knowledge, attitudes, values, and perceptions about e-cigarettes, as well as the social norms they experience. Methods: The Whittemore and Knafl model for integrative review guided the methodology. Three databases were searched from January 2010 through December 2018. The study selection process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. Inclusion and exclusion criteria were applied. Studies were evaluated for quality and strength. Key themes were extracted, coded, and synthesized. Results: Seventy-one full-text studies were assessed for inclusion criteria; 15 articles were included, coded, and analyzed for quality and thematic content. Current e-cigarette users represented just 3% to 35% of study participants. Three themes arose from a synthesis of the literature: “Is it bad for me?,” “I just like it,” and “Is it cool or not?” Conclusions: Young adults are not armed with the accurate knowledge to make informed choices about using e-cigarettes. E-cigarette users are understudied and tend to value appearance and physical sensation over health. Social norms related to e-cigarette use are linked to perception of identity and the current technology-focused culture.

KEY WORDS: culture, electronic nicotine delivery systems, young adult

Problem Identification

The popularity of electronic cigarettes (e-cigarettes) is rapidly increasing, with the highest rates of usage among young adults (Allem et al., 2015; Gottlieb, 2019). Most Americans know about e-cigarettes. One study indicated that awareness of e-cigarettes reached 94.3% of the population in 2014 (Huerta et al., 2017). Yet, long term health risks of e-cigarette use are unknown. However, studies using biomarkers raise concern for cardiovascular and lung health. A causal link between smoking and endothelial dysfunction, associated with cardiovascular disease (CVD), has been established (Golbidi et al., 2018). The same pathophysiological events are being established in association with e-cigarette use. A recent study examined the acute effects of flavored e-cigarette liquids (e-liquids) compared with cigarette use on endothelial health and endothelial cell-dependent macrophage activation (Lee et al., 2019). Results indicated that the inflammatory markers known to be factors in CVD pathogenesis were elevated in serum of both e-cigarette and cigarette users 3 hours post use.

Adding to the evidence of acute pro-inflammatory effects of e-cigarette flavored liquid is retrospective analysis of e-cigarette users and occurrence of a myocardial infarction (MI). Data from 2014 and 2016 indicated a positive association between daily e-cigarette use and having experienced an MI that was independent of the association between traditional cigarette use and MI occurrence (Alzahrani et al., 2018). Though this was a cross-sectional, observational study and prospective studies are needed, it demonstrates that e-cigarette users had a higher prevalence of MI than did non e-cigarette users. Moreover, cardiovascular health is also impacted by respiratory function.

Although aerosol from e-cigarettes contains less toxicants than combustible cigarettes, they are not harmless (*Public health consequences of e-cigarettes*, 2018). Using human airway samples, tests have indicated that innate defense proteins associated with COPD were significantly elevated among e-cigarette users (Reidel et al., 2018). An acute exposure of unflavored vaporized e-liquids has been shown to cause apoptosis and necrosis of alveolar macrophages in vitro (Scott et al., 2018). These findings indicate that exposure to e-cigarette liquids in the vaporized state causes inflammation and death to the cells which capture inhaled dust and microorganisms, and the long-term impact of e-cigarette liquids on human lung function is unknown. These new studies add to existing evidence of the known deleterious effects of nicotine, formaldehyde, and diacetyl which are found in the vaporized liquid (e-liquid). Diacetyl, found in 39 out of 51 e-liquids tested in a study is used as a flavoring agent and can cause the irreversible lung disease bronchiolitis obliterans, or "popcorn lung"(Allen et al., 2016; Farsalinos et al., 2015).

E-cigarette use may be a successful method for smoking cessation for some adults (Tackett et al., 2015). However, e-cigarettes may encourage future tobacco use for youth (Barrington-Trimis et al., 2016; Leventhal et al., 2016). With emerging evidence of potential harms, it is vital to population health to understand the factors that lead to use among young adults, who have both the highest rates of e-cigarette use and may suffer greatly from long-term use (Allem et al., 2015; U.S. Department of Health and Human Services, 2012) . Among young adults 18–24 years of age, e-cigarette use more than doubled from 2013 to 2014 (U. S. Public Health Service, 2016) representing a growing population health concern (Federal Register, 2016). Further adding to the problem, flavoring in e-cigarettes is viewed favorably by young adults (Choi et al., 2012) and

works as a reinforcement of vaping behavior (Audrain-McGovern et al., 2016). The Food and Drug Administration (FDA) banned flavored tobacco products because of their potential attractiveness to children in 2009 (Administration, 2015). A 2016 ruling known as the "deeming act" stated that electronic nicotine delivery, such as e-cigarettes, systems can be regulated by the FDA as tobacco products, but only recently have the laws advanced to banning most flavors of e-liquids. The exceptions to the flavor ban are mint and menthol-flavorings which are favored by adults, but ranked as far less popular by minors and young adults (Harrell et al., 2017). This ban of certain flavorings is aimed at reducing new users among youth and young adults, while preserving an option for smoking cessation of traditional cigarettes by adults.

The young adult years from 18 to 25 are described as emerging adulthood in order to capture the delayed adoption of adult roles (Arnett, 2000). One characteristic of young adulthood is exploration, which may include health behaviors. Another attribute of this age may be poor self- regulation of emotions, which has been linked to risky health behaviors such as smoking traditional cigarettes (Tice et al., 2001). One factor associated with this dysregulation is impulsivity, which may be a risk factor in using addictive substances, including nicotine (Schreiber et al., 2012). Characteristics of young adults who are more inclined to use e-cigarettes are those who identify young adulthood as a time of experimentation and those who have experienced multiple "role transitions" such as gaining or losing a job or a romantic partner (Allem et al., 2015). Social and environmental factors also influence young adults' health behaviors. For example, young people who witness others using e-cigarettes are more likely to use them. Also, attitudes of acceptance of cigarette smoking among those who never smoked cigarettes were found

to be higher among youth who lived with an e-cigarette user, were exposed to e-cigarette advertising, or who used e-cigarettes (Choi et al., 2017). These characteristics of the young adult years and loci of influence are vital in understanding how e-cigarette use is socially and culturally accepted during the formative years in young adulthood.

Role of Culture

Culture encompasses the internalized shared beliefs, knowledge, and behaviors through which a group views their individual and collective experiences (Kagawa Singer et al., 2016). Culture is reflected not only in characteristics of young adults, but also how those elements are transmitted from one individual to another. Adding to the complexity of identifying tacit cultural indicators of this health behavior, is the cultural branding of e-cigarettes. Cultural branding intentionally builds myths or stories of experiences that lead consumers to buy a specific product so they can experience the 'story' for themselves (Holt, 2004). Understanding cultural or sub-cultural process can allow health researchers to develop mediating or moderating interventions that specifically address culture as a health behavior influence(Leininger & McFarland, 2006). Thus, this integrative review (IR) seeks to uncover the tacit meanings that e-cigarettes have in the life of young adults. To explore how the role of culture within the young adult population influences this health behavior, the following questions guided the inquiry: (a) What is the meaning of e-cigarette use among young adults? (b) What are the perceptions, values and social norms associated with e-cigarette use and are they communicated with others? The purpose of this IR is to explore existing literature for elements of culture among young adults including knowledge, attitudes, perceptions, social norms and values about e-cigarettes, to guide future research.

Methods

To ensure a rigorous product, this integrative review was completed according to the model developed by (Whittemore & Knafl, 2005) . This model provides a framework to assess and synthesis multiple types of primary research into a single review (Whittemore & Knafl, 2005). Inclusion of primary research with different methodologies is vital to understanding the problem of e-cigarette use in the young adult population. The model includes guidelines for problem identification, literature search, data evaluation, data analysis, and presentation.

Literature Search

The literature review was conducted with the help of an experienced health sciences librarian and three data bases were searched, CINAHL, PubMed, and Scopus, for relevant articles published between 2010 and 2018. Although the first tariff ruling, which describes all categories of imported goods, is dated for 2006 (*M85579: The tariff classification of a nicotine inhaler and parts from China*, 2006), electronic cigarettes did not become available to the U.S. market until 2007 and awareness and use of e-cigarettes was not immediate. In a preliminary search on the topic of knowledge, perceptions, and attitudes of the young adult population, no related articles were found before 2011. Therefore, a date of 2010 was selected for the purposes of this search to ensure inclusion of possible earlier articles. The ages of 18 to 25 years old is a commonly used age range to define "young adults" for tobacco research in the United States (U.S. Department of Health and Human Services, 2012) and was used for the purposes of this review. Search terms included key words and controlled vocabulary to include three areas. First, the area for the population included "young adults," "emerging adults," "college students," and

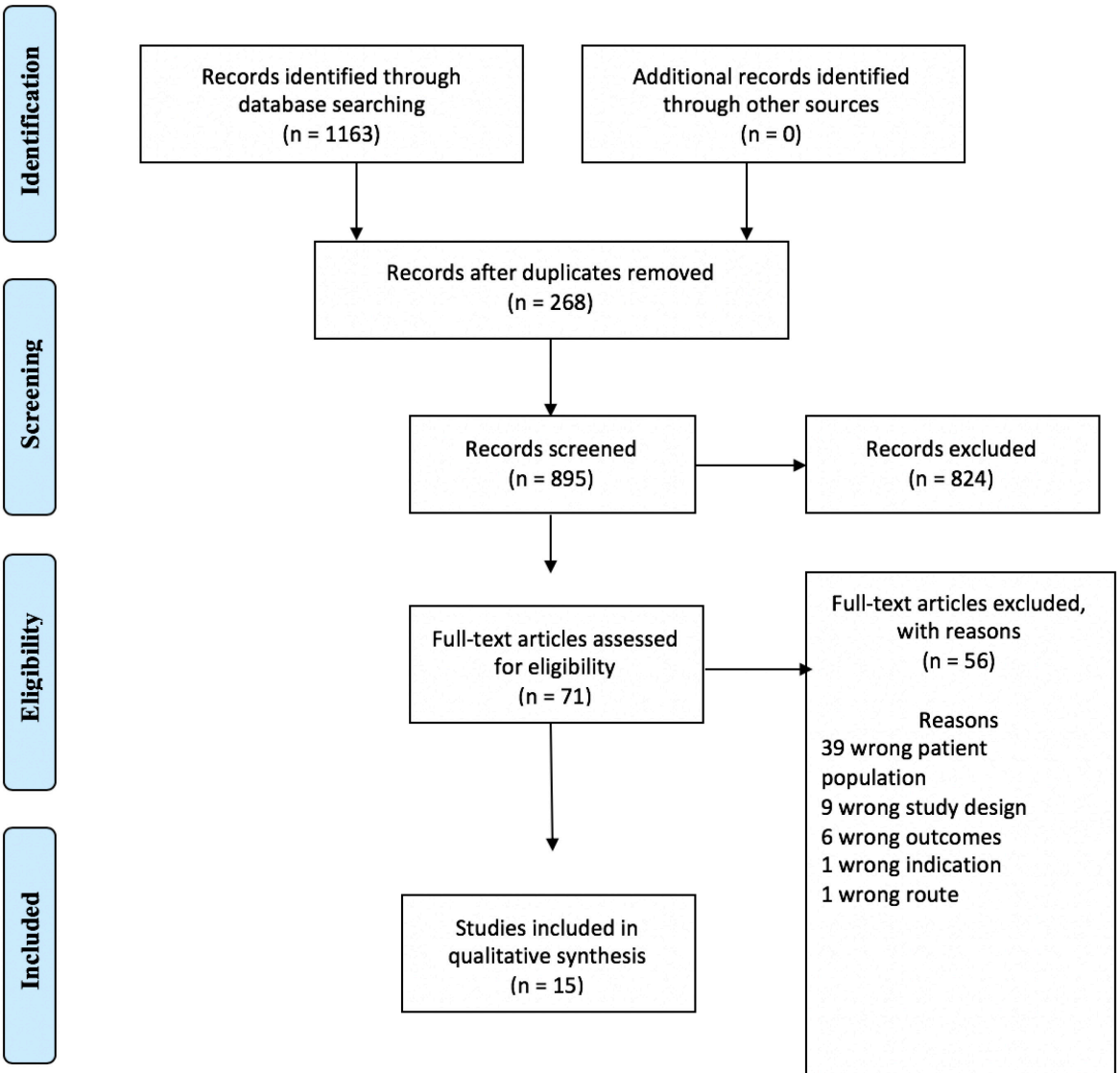
"university students". Second, behavior of e-cigarette use was targeted by using the following terms "e-cigarettes", "vaping", "electronic nicotine delivery systems" and "juul". And third, key words and controlled vocabulary to capture elements of culture were "perception", "attitude to health", "health belief", "culture" and "acculturation." Inclusion criteria for this integrated review were peer reviewed articles written in English in the U.S. that examined adults age 18 -25 with study participants who used e-cigarettes. Articles that expand beyond ages 18-25 had a minimum of 90% of their sample population within the target age range for this review. Both qualitative, quantitative, and mixed method studies were included as well as articles that addressed characteristics of the population such as beliefs, language, values, social norms, attitudes and perceptions towards "vaping", e-cigarettes or use of electronic nicotine delivery systems (ENDS). Exclusion criteria were studies that explored effects of marketing and advertising, a sole focus on e-cigarette initiation, and studies where data on e-cigarette use is compiled with other alternative tobacco products.

The study selection process followed the PRISMA guidelines (see Figure) and included removal of duplicate studies followed by an abstract and title review (n = 895). Articles that were not peer-reviewed, primary research, or not relevant were removed (n = 824). Seventy-one full-text studies were assessed for eligibility. Fifty-six studies were removed because they did not meet inclusion criteria. Articles which did not have a focus on an age range between 18 and 25, had a mean age outside of that range, or did not specify age were removed (n = 39). Another nine were removed for study designs that tested outcomes of social media, advertising or exposure to specific e-cigarette flavors. Studies that had a primary outcome of initiation of e-cigarettes over time were

also excluded (n =6). One study was removed because information on electronic cigarettes and vaping could not be separated from the information exploring perceptions about other alternative tobacco products. Because this IR is focused on the general young adult population, one that correlated use with mental health diagnosis was removed (n = 1). Ultimately, fifteen articles were analyzed according to the research questions.

Figure

PRISMA flowchart



Data Evaluation

A quality scoring tool, the Quality Assessment Tool for Studies with Diverse Design (QATSDD) provided evaluation criteria. The QATSDD, a 16-item scoring tool, had good face-validity, inter-rater reliability, and test-retest reliability when tested by

health services researchers (Sirriyeh et al., 2012). The tool is ideal for this integrative review as it includes criteria for evaluating quantitative, qualitative, and mixed method studies, all of which are included in an integrative review. The 16 criteria within the tool are each scored on a 4-point (0-3) scale, with 0 being missing and a 3 demonstrating excellence. Fourteen of the criteria apply to quantitative studies, and 14 criteria apply to qualitative studies. Mixed methods studies are assessed on all 16 criteria. Thus, the total possible scores for quantitative or qualitative studies range from 0 to 42; a mixed method study has a potential high range score of 46. Higher scores represent higher quality. Of the 15 studies in this integrative review, 11 are quantitative, 3 are qualitative, and 1 is a mixed-method design. The QATSDD scores for this integrative review ranged from 19 to 38 (See Table).

Table

Article evaluations with Quality Assessment Tool for Studies with Diverse Design (QATSDD)

Author (s)	**Design**	**Sample, Sample Size, and Setting**	**Aims**	**Limitations**	**Outcomes**	**Quality Rating QATSSD**
(Berg et al., 2016)	Longitudinal mixed-methods	Ages 18-25 N = 3418 e-cig users = 372 10.9% current e-cigarette use 7 higher education campuses in Georgia	Exploration of psychographic characteristics of tobacco-product use using market research methods. Document tobacco use over time by young adults in college.	Regionally restricted in Georgia to certain colleges and universities may have selection bias. Low response/recruitment rate	Characteristics associated with e-cigarette use included being male, not being black, attending technical college, novelty seeking, not being a socially conservative thinker	31

(K. Case et al., 2016)	Qualitative Structured interviews	College students Age range 18 to 26 N= 30 equal number of e-cig users and non-users One large southwestern university	Explored theoretical constructs relevant to college student's e-cigarette use. Intent to use information for future health communication campaigns	Low number of current e-cigarette users recruited from single university. Used a structured interview which focused on Health Belief Model construct, this could have excluded other relevant information. Small sample size	Participants perceived e-cigarettes as less harmful than traditional cigarettes. Both non- e- cigarette and e-cigarette users most reported concern about addiction and potential health concerns of e-cigarette use.	20

Author (s)	Design	Sample, Sample Size, and Setting	Aims	Limitations	Outcomes	Quality Rating QATSSD
(Maria Cooper et al., 2017)	Cross-sectional	Ages 18-26 if not a tobacco user and 18-29 if current tobacco user. N =5482 Non-user = 3663 Cig= 633 e-cig = 429 dual = 478 24 colleges in Texas	Explores the relationship between dual and ENDS/ cigarette use and perceptions of harm and addictiveness of both products.	Cross sectional Limited to Texas	Among college students, perceptions of harm and addictiveness of e-cigarettes are lower than those for conventional cigarettes. For both products, perceptions of harm and addictiveness were lower among exclusive and dual users, compared to non-users.	32

Author (s)	**Design**	**Sample, Sample Size, and Setting**	**Aims**	**Limitations**	**Outcomes**	**Quality Rating QATSSD**
(Copeland et al., 2017)	Cross-sectional	College Students Mean age 20.7 N = 734 F= 78.1 Caucasian =76.4% Daily e-cig use = 3%	Developed the Risks and Benefits of E-cigarettes (RABE) questionnaire to assess the perceptions about e-cigarette use among college students.	No assessment of outcome expectancies. Questions were based on small amount of literature, "college- aged" students- no age range clearly defined Cross-Sectional	RABE is a reliable instrument to measure college student's perceived risks and benefits of e-cigarettes.	28

Author (s)	**Design**	**Sample, Sample Size, and Setting**	**Aims**	**Limitations**	**Outcomes**	**Quality Rating QATSSD**
(Hart et al., 2017)	Cross-sectional	College students Age range 18-37, mean age = 20.5 N= 652 Current e-cig users = 42 Large Midwestern University	Compared perceptions of e-cigarette safety between 3 groups; never-tried, tried, and current users of e-cigarettes	Limited to one college campus No causal inferences can be made	Those who have tried or are current users have more positive view of devices; 87% of participants were aware of e-cigarettes Current use associated with being male	19

Author (s)	**Design**	**Sample, Sample Size, and Setting**	**Aims**	**Limitations**	**Outcomes**	**Quality Rating QATSSD**
(Hess et al., 2017)	Qualitative	Black young adults (ages 18–25 yrs.) smokers and non-smokers N= 46: M = 22; F = 24 Current tobacco users = 25	Examined perceptions of e-cigarettes among Black young adults to explore the meanings these youth ascribe to e-cigarettes and the role that identity	E-cig use for year, but cig use in last 30 days. Unclear if any participants were current ENDS users, Open ended questions about e-cigs introduced after	Black youth perceive e-cigarettes as a smoking cessation tool, and as a way to demonstrate unique social identity. Participants saw e-cigarette users in terms of race and class identity.	26

		San-Francisco area	plays in how these devices are viewed.	10 interviews were completed. Theoretical ideas based on researchers' interpretation		
Author(s)	**Design**	**Sample, Sample Size, and Setting**	**Aims**	**Limitations**	**Outcomes**	**Quality Rating QATSSD**
(H. Y. Lee et al., 2017)	Cross-sectional	College students Ages 18 to 25 N = 1185 M= 394 White=853; Black =58; Hispanic=48;	Investigated characteristics of potential and current e-cigarette users based on four levels of use-acceptability	Self-report questionnaire Convenience sample Single University	Early adopters indicated that e-cigarettes are more socially acceptable than traditional cigs than did other groups. Flavors influenced use. Reported reasons for e-cig use were;	36

		Asian/Pacific Islander=180; Other =46 40% ever-users 1 Midwestern University	and factors that promote acceptability of use		positive sensory experience and caring more about appearance than health.	
Author (s)	**Design**	**Sample, Sample Size, and Setting**	**Aims**	**Limitations**	**Outcomes**	**Quality Rating QATSSD**
(Maglalang et al., 2016)	Cross Sectional	Ages 18- 25 N = 501 F = 57% 15% LGBTQIA	Explored patterns of use, differences between ENDS users and non-users-	Convenience sample Cross-sectional	E-cig use is 2-fold for mean vs. women, Filipino and Vietnamese vs Chinese, LGBTQIA, vocationally trained and employed	28

		44% ever-users 11% current users Asian American and Pacific Islanders in California	especially initiation of use.		37/56 reported flavor preferences Learning about e-cigarettes from friends was associated with trying e-cigs but not associated with current use Lower perception of harm was correlated with a 3-fold chance of ever trying and 6-fold chance of being a current e-cig user.	
Author (s)	**Design**	**Sample, Sample Size, and Setting**	**Aims**	**Limitations**	**Outcomes**	**Quality Rating QATSSD**

(Martinasek et al., 2018)	Cross-sectional	College students Ages 18 and over N= 989 51.4 % ever users 67.7 % female White = 709 Black = 54 Hispanic = 107 Asian/PI = 38 Multi = 45 Florida university	To explore social and behavioral aspects among college students	6.8% 23 or older- no clear cut off Cross sectional	Slightly more than half of participants reported ever using e-cigarettes and other tobacco. Males significantly more likely to use e-cigarettes. Participants using multiple tobacco products was more prevalent among participants who have tried e-cigs. Perceptions of harm of both the primary and secondary vapor were considered to be less than that of traditional cigarettes.	27

					Indicated that peers were the primary influencer for initial use. Patterns of participant tobacco use were categorized as abstainers (70%), hookah users only (14%), e-cigarettes only (11%), and polytobacco users (4%).	
(McDonald & Ling, 2015)	Qualitative 17 focus groups by 12 semi-structured interviews	Age 18-27 N= 87 New York City	To explore the use of ENDS among young adults in New York City in order to understand the related beliefs, opinions and practices.	Small sample	Participants frequently reported experimentation with e-cigarettes. Participants reported that their limited e-cig knowledge came from e-cig advertisements.	29

					Participants reported using bodily sensations to judge potential risks and benefits of e-cigarettes. Participants perceived e-cigs as a 'toy' similar to other common use technologies.	

Author (s)	Design	Sample, Sample Size, and Setting	Aims	Limitations	Outcomes	Quality Rating QATSSD
(P. Pokhrel et al., 2014)	Cross-sectional	College students Mean age 23.5 N =307 1 4-year and 2 2-year colleges in Oahu, HI	Development of a self-report survey to assess e-cigarette outcome expectancies among college students. Determine dimensions of e-cigarette use expectancies and their associations	One college in Hawaii Cross sectional. Expectancy survey items were adapted from prior ENDS research. Convenience sample Small sample size	Being a current cigarette smoker had a positively related to positive expectancies and was inversely related with negative expectancies. Higher positive expectancies were associated with greater likelihood of past-30-day e-cigarette use and higher negative expectancies were significantly associated with lower likelihood of past-30-day e-	35

			with e-cig use and use expectancies		cigarette use, with the exception of addiction concerns. Among e-cigarette never-users, positive expectancies were positively related to greater intentions of future e-cigarette use.	

Author (s)	**Design**	**Sample, Sample Size, and Setting**	**Aims**	**Limitations**	**Outcomes**	**Quality Rating QATSSD**
(Saddleson et al., 2016)	Cross-sectional	Undergraduate students ages 18–23 Among e- cig ever users (n = 429) Mean age = 19	To discover what drives college students to use e-cigs.	Cross sectional New York Convenience sample Only 15 current users	Using e-cigs for enjoyment was associated with current non-daily and current daily use Non-daily use was related to use because e-cigs are less toxic than cigarettes.	30

		Total of 15 current e-cig users 4 universities in New York State were surveyed.			More daily users reported use to quit smoking compared with either non-daily or discontinued users. Among current users, 72.3% used for enjoyment, compared with 42.9% of discontinued users.	

Author (s)	**Design**	**Sample, Sample Size, and Setting**	**Aims**	**Limitations**	**Outcomes**	**Quality Rating QATSSD**
(Trumbo & Harper, 2016a)	Cross-sectional Secondary data analysis	Ages 18 to 24 N = 874 Students = 465 Non-students = 409 National	To explore attitudes and use of e-cigarettes among college going and straight to work young adults and to examine the behavior associated with e-cigarette use.	Low percentage of current vapers, 19.7% report "former vaper" status, but it is unclear if this is based on ever trying	Attitude, norms, innovation, and information have medium-to-strong associations with the two key variables of interest: behavioral intention to use an electronic cigarette and acceptability of public use of e-cigarettes.	38

				vaping or sustained daily use. Self-report Cross- sectional design	No contrasts between student and non-students, Positive expectancies were similar for both e-cigs and traditional cigs	

ENDS = electronic nicotine delivery systems

F = Female

LGBTQIA = lesbian, gay, bisextual, queer, intersex

M = Male

Data Analysis

All included studies were published between 2014 and 2018. The sample populations frequently included more females than males (Berg et al., 2016; Maria Cooper et al., 2017; Copeland et al., 2017; Hess et al., 2017; H.-Y. Lee et al., 2017; Maglalang et al., 2016; Martinasek et al., 2018; Pokhrel et al., 2013; Pokhrel, Lam, et al., 2018; Pallav Pokhrel et al., 2014). The studies included predominantly white participants with the exception of (Hess et al., 2017) who studied only black young adults and (Maglalang et al., 2016) who studied Asian American and Pacific Islander young adults in California. Several studies reported only limited demographics (Hart et al., 2017; McDonald & Ling, 2015; Trumbo & Harper, 2015b, 2016b). Study participants who were current e-cigarette users ranged from 3% (Copeland et al., 2017) to 35% (Pokhrel, Lam, et al., 2018).

The QATSSD tool and a table for organization aided in the systematic extraction of each study's data, the synthesis of information, and assessment of study quality. Elements included in the Table are the author and year the article was published, the sample characteristics, sample size, study setting, the aims, limitations, study outcomes, and the quality assessment. Extracted data were clustered by similarities. Clusters were further coded by the author using the guiding research questions, and categories were formed. These categories were reflected upon, synthesized and reduced to identify three main themes within the literature.

Results

Three themes emerged from the existing literature including: *Is it bad for me?, I just like it, Is it cool or not?*

Is it bad for me? Data indicated that young adults felt they had limited knowledge (McDonald & Ling, 2015) and indicated a lack of evidence communicated to them. Many

believed that the liquid used in e-cigarettes produced nothing more than water vapor. Although 75.8% of the participants in one study recognized e-cigarettes as a tobacco product, those who were current users were less likely to do so (Hart et al., 2017). Eight studies indicated that participants perceived a lower risk of harm from e-cigarettes than from traditional cigarettes (Kathleen Case et al., 2016; Cooper et al., 2018; Copeland et al., 2017; Maglalang et al., 2016; Martinasek et al., 2018; McDonald & Ling, 2015; Trumbo, 2018; Trumbo & Harper, 2016a). However, while one study indicated participants perceived a low risk of e-cigarettes, another indicated a lower relative risk (Maglalang et al., 2016; McDonald & Ling, 2015). In other words, participants saw it as healthier, but not necessarily free of harm or confused the idea of *healthier than* with *healthy*. Further, those who use both traditional cigarettes and e-cigarettes (dual users) reported lower perception of harm by e-cigarettes in one study (M. Cooper et al., 2017), and in another, no statistically significant difference in perceived harm was found between e-cigarettes users, non-users and dual users (Copeland et al., 2017). Yet, this same study did indicate that current e-cigarette-users perceived more benefits to using e-cigarettes than those who had never tried them. Interestingly, one study indicated that 57.1% of participants perceived e-cigarette use as unsafe (Hart et al., 2017). A more recent article reported concern of addiction (Pokhrel, Fagan, et al., 2018). Another perception about e-cigarettes use was that it could be used as a quit aid (Maglalang et al., 2016), particularly for older people (Hess et al., 2017).

I just like it. The theme of *I just like it*, uncovered the underlying reasons for why young adults like using e-cigarettes and illuminated motivation for use. For many young adults who use electronic cigarettes, it is linked to a positive sensory experience (Pokhrel et al., 2016; Pokhrel et al., 2015). Study participants identified that taste was an important factor in using e-cigarettes (H.-Y. Lee et al., 2017; McDonald & Ling, 2015). The evidence of flavor as a motivator to e-

cigarette use is now well documented and is beginning to drive policy (Gottlieb, 2019; Harrell et al., 2017). However, taste was not the only aspect important to e-cigarette users.

Other aspects of e-cigarettes are also attractive to young adults. One study reported 72.1% of the current e-cigarette users did so for enjoyment (Saddleson et al., 2016), but that enjoyment didn't entirely revolve around flavor and taste of e-cigarettes. Young adults identified values such as interest in e-cigarettes due to personal interests in the mechanics of it (Berg et al., 2016). Further, e-cigarettes were found to be an interesting innovation which drew some young adults to use them (Trumbo & Harper, 2015a). Other young adults identified e-cigarettes as a 'toy,' which may speak to culture of technology (McDonald & Ling, 2015). Young adults reported attitudes of novelty seeking behavior and engaging in self-focused thinking; these attitudes more frequently present in e-cigarette-users than non-e-cigarette-users (Berg et al., 2016). Study participants even expressed valuing appearance over health (H.-Y. Lee et al., 2017).

Is it cool or not? Perceptions about the social acceptability of e-cigarette use varied greatly between e-cigarette users and non-users. In one study, users and non-users reported social stigma as a disadvantage to e-cigarette use and that using e-cigarettes can be a social barrier due to friends who do not approve (Kathleen Case et al., 2016), but other studies report that e-cigarettes are used for social or recreational use (Maglalang et al., 2016). However, another study indicated that peer influence was a primary reason for trying e-cigarettes (Martinasek et al., 2018). In general, those who were early adopters of e-cigarettes reported that use is more socially acceptable (H.-Y. Lee et al., 2017). Two studies reported social enhancement with use (Pokhrel, Fagan, et al., 2018; Pallav Pokhrel et al., 2014) where "social enhancement" was defined as the participants' belief that they will be liked more or be more socially acceptable to others. While e-

cigarette users indicated that use in public was acceptable, non-users reported the opposite (Kathleen Case et al., 2016).

Beyond acceptability, several studies explored how young adults perceived their own social identity with regard to using e-cigarettes in public. One e-cigarette user reported a fear of looking silly when vaping in public (McDonald & Ling, 2015), which was supported by reports of a negative social consequence of e-cigarette use in public as "looking awkward"(Pokhrel, Fagan, et al., 2018). Non-users reported views that those who use e-cigarettes in public are "rebellious" (McDonald & Ling, 2015), have a negative appearance (Pallav Pokhrel et al., 2014), look like "hipsters" (Hess et al., 2017),"dorks" or "addicts" (K. Case et al., 2016).

Discussion

This review synthesizes the literature on e-cigarette use to describe e-cigarette culture among, that is, attitudes, values and common beliefs held by young adult e-cigarette users. The literature highlights that young adults who use e-cigarettes lack awareness of the potential health effects that the product may have; further, young adults may not seek out health related information due to enjoyment of using e-cigarettes and wanting to believe that they are both safe and will not injure one's personal appearance in the way traditional cigarettes do. Young adults identified the potential harm of e-cigarettes through a lens of relative harm. If they believe it is less harmful that traditional cigarettes, they may find it more acceptable. Lastly, for the young adults engaged in this behavior, there may be a mystique of being different or separate from the mainstream crowd. Though they may feel judged at times, there is some benefit to identifying oneself as different through a health behavior such as e-cigarette use and thus being a part of a smaller group with a similar interest (McDonald & Ling, 2015). As the physiological effects of e-cigarette use continues to be discovered, a focus on understanding the behavior of the groups

of people who are at highest risk for deleterious effects should also continue. Part of understanding health behaviors includes understanding the social and cultural drivers of an individual's choices who identify as belonging to a larger group or sub-culture.

Current policy for warning labels to advise consumers of risks of nicotine addiction has been added to packaging based on current evidence (Lee et al., 2018), however warnings are limited only to the risk of nicotine addiction and do not warn of any other harmful effects. Further research will be needed to not only assess for long-term health effects, but also the best way to communicate health risks to young adults. Young adults have been found to have a lessened perception of harm after exposure to advertising(Reinhold et al., 2017). Therefore, research that assesses the health warnings within advertisements should also be conducted to determine advertising policy and recommend restrictions on advertising that aligns with current traditional cigarette advertising. Effective policy should include an understanding of the characteristics, motivations, and culture of young adults. One recent advance in protecting public health with respect to e-cigarettes has been the proposed policies by the former FDA commissioner. This policy will ban all flavors in e-liquids with the exception of tobacco, mint, and menthol-flavors. Although menthol flavor was found to be among the most cytotoxic, youth and young adults tend to rate attractiveness of this flavor less than adults. Younger e-cigarette users rate candy and fruit flavors highly, whereas adult users prefer the menthol and mint flavors. In order to promote both smoking cessation by adults and prevention of e-cigarette initiation by youth and young adults, menthol flavored e-liquid will be exempted from the ban, but menthol-flavor in traditional cigarettes will now be banned. The commissioner has been clear that the popularity of these flavorings in e-liquids will be monitored, and if they become popular in youth and young adults, the policy will be reviewed (Gottlieb, 2019).

The ages between 18 and 25 are targeted by tobacco companies for advertising and marketing. Particularly, tobacco companies capitalize on characteristics of the young adult and create an association with tobacco use around these role transitions and building of an adult identity (Ling & Glantz, 2002). Public health campaigns should focus on dispelling myths, and policy should be developed to ensure possible risks are communicated in advertisements. Likewise, because celebrity endorsement of e-cigarettes on social media have been found to influence vaping behavior (Phua et al., 2018), health campaigns should directly use social media platforms to combat this influence.

Implications for nursing practice include identification of groups who are at high risk for initiation of e-cigarette use. Also, education must focus on dispelling myths that e-liquid is water vapor as well as the concept of relative risk as it pertains to tobacco products. Young adults who do not currently smoke cigarettes should be educated that e-cigarettes are not a recommended alternative to other tobacco products and that they carry unique health risks as well as risk of nicotine addiction. Nurses should be aware of current evidence-based treatment recommended for tobacco cessation including nicotine replacement therapy and cessation counseling services. Evidence that describes the characteristics associated with e-cigarette use and viewpoints related to health is useful to nurses. Nursing can use current knowledge to identify those who are at high risk for initiation of e-cigarettes use or dual use of electronic and traditional cigarettes. In particular, nurses and other health care providers must use this understanding of young adults' health beliefs, attitudes, and perceptions to prevent e-cigarette use and future health concerns related to the cardiovascular and cardiopulmonary systems.

The literature described in this review suggests a number of questions for future research. The majority of the participants in the studies included in this review were not current e-cigarette

users. To uncover the meaning of vaping to people who use e-cigarettes, future studies should focus recruitment on those currently engaged in the behavior. Females were overly represented in most studies. Since current e-cigarette users were more likely to be male (Hart et al., 2017; Maglalang et al., 2016; Martinasek et al., 2018), this limits the perspective of current e-cigarette-users. On the other hand, because female e-cigarette-users make up a lesser percentage than male e-cigarette-users, their unique perspective may be valuable in understanding cultural contexts that are sex dependent.

Though two studies began to look at social enhancement, which may reflect an aspect of culture, limited exploration of the culture of e-cigarette use by young adults was evident. For example, language is used to create conceptual clarity and is vital to understanding culture (Alexander et al., 2016). (Alexander et al., 2016) conducted a study of this nature in the general adult population, but no studies were found that discussed language specific to e-cigarette use in the young adult population. Future research should examine language and communication unique to young adults who use e-cigarettes.

Although this integrative review sought to illuminate the meaning of e-cigarettes and their use to young adults who are current users, only one study actually addressed the concept of meaning,(Hess et al., 2017) but the participants of the study were not screened for current e-cigarette use. Thus, the concept of meaning to the young adults who are currently engaged in e-cigarette use in still not fully explored. The second question this integrative review sought to answer was what are the perceptions, values and social norms associated with e-cigarette use and are they communicated with others? The current literature addresses these concepts, but as previously discussed, the majority of study participants were not current e-cigarette-users. The limited numbers of study participants who were e-cigarette-users gives us information in

comparison to young adults who are not e-cigarette-users but limits the perspectives of current e-cigarette-users.

Strengths and limitations

Limitations of the integrative review included that the review was limited to English-only articles; thus, studies that examined the perspectives of young adults from non-English speaking countries may have been missed. Second, because this topic is being aggressively evaluated, the information is rapidly changing and updated, making a completely comprehensive review difficult. These limitations were also met with strengths. An exhaustive search was conducted over the most relevant time period with assistance from an experienced health sciences librarian. This was the first integrative review to analyze the current literature about the characteristics of e-cigarette use among young adults. Lastly, the literature included in this review had overall strong quality scores.

Conclusion

This integrative review found that young adults continue to hold misconceptions about the health risks of e-cigarettes, that they are motivated by liking the sensation of e-cigarettes (particularly taste), and that there are some elements of social identity associated with use. The three themes that emerged from this integrative review provide information to help health care providers understand the relevant characteristics and motivations for e-cigarette use among young adults. Primary and secondary prevention that focuses on knowledge and intercepts harmful behavior, like e-cigarette use, has a far greater health advantage to the population than a wait-and-see approach. The damage that smoking has had on generations of Americans is well-documented. Moreover, 99% of the time, long term addiction to nicotine starts before age 25 (U.S. Department of Health and Human Services, 2012). Preliminary studies show the pro-

inflammatory effects of e-cigarettes on human tissue are the same as traditional smoking, thus setting up a potential trajectory for heart and lung disease. Further research is needed to fully understand the meaning of e-cigarette use to young adults in order to be fully effective health counselors and advocates for appropriate public health policy.

References

U.S. Food and Drug Administration (2015). *What are the FDA's Policies on Flavored Tobacco?* https://www.fda.gov/AboutFDA/Transparency/Basics/ucm208085.htm

Alexander, J. P., Coleman, B. N., Johnson, S. E., Tessman, G. K., Tworek, C., & Dickinson, D. M. (2016). Smoke and Vapor: Exploring the terminology landscape among electronic cigarette users. *Tob Regul Sci*, *2*(3), 204-213. https://doi.org/10.18001/trs.2.3.1

Allem, J.-P., Forster, M., Neiberger, A., & Unger, J. B. (2015). Characteristics of emerging adulthood and e-cigarette use: Findings from a pilot study. *Addictive Behaviors*, *50*, 40-44. https://doi.org/https://doi.org/10.1016/j.addbeh.2015.06.023

Allen, J. G., Flanigan, S. S., LeBlanc, M., Vallarino, J., MacNaughton, P., Stewart, J. H., & Christiani, D. C. (2016). Flavoring chemicals in e-cigarettes: Diacetyl, 2,3-pentanedione, and acetoin in a sample of 51 products, including fruit-, candy-, and cocktail-flavored e-cigarettes. *Environmental Health Perspectives*, *124*(6), 733-738. https://doi.org/10.1289/ehp.1510185

Alzahrani, T., Pena, I., Temesgen, N., & Glantz, S. A. (2018). Association between electronic cigarette use and myocardial infarction [journal article]. *American Journal of Preventive Medicine*, *55*(4), 455-461. https://doi.org/10.1016/j.amepre.2018.05.004

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, *55*(5), 469.

Audrain-McGovern, J., Strasser, A. A., & Wileyto, E. P. (2016). The impact of flavoring on the rewarding and reinforcing value of e-cigarettes with nicotine among young adult smokers. *Drug and Alcohol Dependence*, *166*, 263-267. https://doi.org/https://doi.org/10.1016/j.drugalcdep.2016.06.030

Barrington-Trimis, J. L., Urman, R., Berhane, K., Unger, J. B., Cruz, T. B., Pentz, M. A., Samet, J. M., Leventhal, A. M., & McConnell, R. (2016). E-Cigarettes and future cigarette use. *Pediatrics*, *138*(1), 1-8. https://doi.org/10.1542/peds.2016-0379

Berg, C. J., Haardorfer, R., Lewis, M., Getachew, B., Lloyd, S. A., Thomas, S. F., Lanier, A., Trepanier, K., Johnston, T., Grimsley, L., Foster, B., Benson, S., Smith, A., Barr, D. B., & Windle, M. (2016). DECOY: Documenting experiences with cigarettes and other tobacco in young adults. *American Journal of Health Behavior*, *40*(3), 310-321. https://doi.org/10.5993/ajhb.40.3.3

Case, K., Crook, B., Lazard, A., & Mackert, M. (2016). Formative research to identify perceptions of e-cigarettes in college students: Implications for future health communication campaigns. *Journal of American College Health*, *64*(5), 380-389. https://doi.org/10.1080/07448481.2016.1158180

Choi, K., Fabian, L., Mottey, N., Corbett, A., & Forster, J. (2012). Young adults' favorable perceptions of snus, dissolvable tobacco products, and electronic cigarettes: findings from a focus group study. *American Journal of Public Health*, *102*(11), 2088-2093. https://doi.org/10.2105/ajph.2011.300525

Choi, K., Grana, R., & Bernat, D. (2017). Electronic Nicotine Delivery Systems and Acceptability of adult cigarette smoking among florida youth: Renormalization of smoking? *Journal of Adolescent Health*, *60*(5), 592-598. https://doi.org/https://doi.org/10.1016/j.jadohealth.2016.12.001

Cooper, M., Loukas, A., Case, K. R., Marti, C. N., & Perry, C. L. (2018). A longitudinal study of risk perceptions and e-cigarette initiation among college students: Interactions with

smoking status. *Drug and Alcohol Dependence*, *186*, 257-263. https://doi.org/10.1016/j.drugalcdep.2017.11.027

Cooper, M., Loukas, A., Harrell, M. B., & Perry, C. L. (2017). College students' perceptions of risk and addictiveness of e-cigarettes and cigarettes. *Journal of American College Health*, *65*(2), 103-111. https://doi.org/10.1080/07448481.2016.1254638

Copeland, A. L., Peltier, M. R., & Waldo, K. (2017). Perceived risk and benefits of e-cigarette use among college students. *Addictive Behaviors*, *71*, 31-37. https://doi.org/10.1016/j.addbeh.2017.02.005

Farsalinos, K. E., Kistler, K. A., Gillman, G., & Voudris, V. (2015). Evaluation of electronic cigarette liquids and aerosol for the presence of selected inhalation toxins. *Nicotine and Tobacco Research*, *17*(2), 168-174. https://doi.org/10.1093/ntr/ntu176

Federal Register. (2016). *Deeming tobacco products to be subject to the federal food, drug, and cosmetic act, as amended by the family smoking prevention and tobacco control act; restrictions on the sale and distribution of tobacco products and required warning statements for tobacco products*. National Archives and Records Administration Retrieved from https://www.gpo.gov/fdsys/pkg/FR-2016-05-10/pdf/2016-10685.pdf

Golbidi, S., Edvinsson, L., & Laher, I. (2018). Smoking and endothelial dysfunction. *Current Vascular Pharmacology*. https://doi.org/10.2174/1573403X14666180913120015

Gottlieb, S. (2019). *Modifications to compliance policy for certain deemed tobacco products: Guidance for industry*. U.S. Department of Health and Human Services, Food and Drug Admnistration, Center for Tobacco Products Retrieved from O'ffice of Compliance and ENforcement, Office of Health Communication and Educations, Office of Reculations, and Offic of Science in the Center for Tobacco Products at the FDA.

Harrell, M. B., Weaver, S. R., Loukas, A., Creamer, M., Marti, C. N., Jackson, C. D., Heath, J. W., Nayak, P., Perry, C. L., Pechacek, T. F., & Eriksen, M. P. (2017). Flavored e-cigarette use: Characterizing youth, young adult, and adult users. *Preventative Medicine Reports*, *5*, 33-40. https://doi.org/https://doi.org/10.1016/j.pmedr.2016.11.001

Hart, E. P., Sears, C. G., Hart, J. L., & Walker, K. L. (2017). Electronic cigarettes and communication: An examination of college students' perceptions of safety and use. *Kentucky Journal of Communication*, *36*(1), 35-51.

Hess, C. A., Antin, T. M., Annechino, R., & Hunt, G. (2017). Perceptions of e-cigarettes among black youth in california. *International Journal of Environmental Research and Public Health*, *14*(1). https://doi.org/10.3390/ijerph14010060

Holt, D. (2004). *How brands become icons: The principles of cultural branding*. Harvard Busines School Press.

Huerta, T. R., Walker, D. M., Mullen, D., Johnson, T. J., & Ford, E. W. (2017). Trends in e-cigarette awareness and perceived harmfulness in the U.S. *American Journal of Preventive Medicine*, *52*(3), 339-346. https://doi.org/10.1016/j.amepre.2016.10.017

Kagawa Singer, M., Dressler, W., George, S., Baquet, C. R., Bell, R. A., Burhansstipanov, L., Burke, N. J., Dibble, S., Elwood, W., Garro, L., Gravlee, C. C., Guarnaccia, P., Hecht, M. L., Henderson, J., Hruschka, D., Lewis-Fernández, R., Like, R., Mouton, C., Myers, H. F., Page, J. B., Pasick, R., Pescosolido, B., Schoenberg, N., Stoner, B., Strayhorn, G., Szalacha, L., Trimble, J., Weisner, T. S., & Williams, D. (2016). Culture: The missing link in health research. *Social Science & Medicine*, *170*, 237-246. https://doi.org/https://doi.org/10.1016/j.socscimed.2016.07.015

Lee, H.-Y., Lin, H.-C., Seo, D.-C., & Lohrmann, D. K. (2017). Determinants associated with e-cigarette adoption and use intention among college students. *Addictive Behaviors*, *65*, 102-110. https://doi.org/10.1016/j.addbeh.2016.10.023

Lee, W. H., Ong, S.-G., Zhou, Y., Tian, L., Bae, H. R., Baker, N., Whitlatch, A., Mohammadi, L., Guo, H., Nadeau, K. C., Springer, M. L., Schick, S. F., Bhatnagar, A., & Wu, J. C. (2019). Modeling cardiovascular risks of e-cigarettes with human-induced pluripotent stem cell–derived endothelial cells. *Journal of the American College of Cardiology*, *73*(21), 2722-2737. https://doi.org/https://doi.org/10.1016/j.jacc.2019.03.476

Leininger, M. M., & McFarland, M. R. (2006). *Culture care diversity and universality a worldwide nursing theory* (2nd ed.. ed.). Sudbury, MA : Jones and Bartlett.

Leventhal, A. M., Stone, M. D., Andrabi, N., & et al. (2016). Association of e-cigarette vaping and progression to heavier patterns of cigarette smoking. *Journal of the American Medical Association*, *316*(18), 1918-1920. https://doi.org/10.1001/jama.2016.14649

Ling, P. M., & Glantz, S. A. (2002). Why and how the tobacco industry sells cigarettes to young adults: Evidence from industry documents. *American Journal of Public Health*, *92*(6), 908-916. https://doi.org/10.2105/AJPH.92.6.908

M85579: The tariff classification of a nicotine inhaler and parts from China. (CLA-2-85:RR:NC:N1:112 M85579). (2006).

Maglalang, D. D., Brown-Johnson, C., & Prochaska, J. J. (2016). Associations with e-cigarette use among Asian American and Pacific Islander young adults in California. *Preventive Medicine Reports*, *4*, 29-32. https://doi.org/10.1016/j.pmedr.2016.05.011

Martinasek, M. P., Bowersock, A., & Wheldon, C. W. (2018). Patterns, perception and behavior of electronic nicotine delivery systems use and multiple product use among young adults. *Respiratory Care*, *63*(7), 913-919. https://doi.org/10.4187/respcare.06001

McDonald, E. A., & Ling, P. M. (2015). One of several 'toys' for smoking: young adult experiences with electronic cigarettes in New York City. *Tobacco Control*, *24*(6), 588-593. https://doi.org/10.1136/tobaccocontrol-2014-051743

Phua, J., Jin, S. V., & Hahm, J. M. (2018). Celebrity-endorsed e-cigarette brand Instagram advertisements: Effects on young adults' attitudes towards e-cigarettes and smoking intentions. *Journal of Health Psychology*, *23*(4), 550-560. https://doi.org/10.1177/1359105317693912

Pokhrel, P., Fagan, P., Herzog, T. A., Chen, Q., Muranaka, N., Kehl, L., & Unger, J. B. (2016). E-cigarette advertising exposure and implicit attitudes among young adult non-smokers. *Drug & Alcohol Dependence*, *163*, 134-140. https://doi.org/10.1016/j.drugalcdep.2016.04.008

Pokhrel, P., Fagan, P., Herzog, T. A., Laestadius, L., Buente, W., Kawamoto, C. T., Lee, H.-R., & Unger, J. B. (2018). Social media e-cigarette exposure and e-cigarette expectancies and use among young adults. *Addictive Behaviors*, *78*, 51-58. https://doi.org/10.1016/j.addbeh.2017.10.017

Pokhrel, P., Fagan, P., Kehl, L., & Herzog, T. A. (2015). Receptivity to e-cigarette marketing, Harm Perceptions, and E-cigarette Use. *American Journal of Health Behavior*, *39*(1), 121-131. https://doi.org/10.5993/AJHB.39.1.13

Pokhrel, P., Fagan, P., Little, M. A., Kawamoto, C. T., & Herzog, T. A. (2013). Smokers who try e-cigarettes to quit smoking: Findings from a multiethnic study in Hawaii. *American Journal of Public Health*, *103*(9), e57-62. https://doi.org/10.2105/AJPH.2013.301453

Pokhrel, P., Lam, T. H., Pagano, I., Kawamoto, C. T., & Herzog, T. A. (2018). Young adult e-cigarette use outcome expectancies: Validity of a revised scale and a short scale. *Addictive Behaviors*, *78*, 193-199. https://doi.org/10.1016/j.addbeh.2017.11.019

Pokhrel, P., Little, M. A., Fagan, P., Muranaka, N., & Herzog, T. A. (2014). Electronic cigarette use outcome expectancies among college students. *Addictive Behaviors*, *39*(6), 1062-1065. https://doi.org/10.1016/j.addbeh.2014.02.014

Pokhrel, P., Little, M. A., Fagan, P., Muranaka, N., & Herzog, T. A. (2014). Electronic cigarette use outcome expectancies among college students. *Addictive Behaviors*, *39*(6), 1062-1065. https://doi.org/10.1016/j.addbeh.2014.02.014

Public health consequences of e-cigarettes. (2018). (E. national Academies of Sciences, and Medicine, Ed.). The National Academies Press. https://doi.org/https://doi.org/10.17226/24952.

Reidel, B., Radicioni, G., Clapp, P. W., Ford, A. A., Abdelwahab, S., Rebuli, M. E., Haridass, P., Alexis, N. E., Jaspers, I., & Kesimer, M. (2018). E-cigarette use causes a unique innate immune response in the lung, involving increased neutrophilic activation and altered mucin secretion. *American Journal of Respiratory and Critical Care Medicine*, *197*(4), 492-501. https://doi.org/10.1164/rccm.201708-1590OC

Reinhold, B., Fischbein, R., Bhamidipalli, S. S., Bryant, J., & Kenne, D. R. (2017). Associations of attitudes towards electronic cigarettes with advertisement exposure and social

determinants: a cross sectional study. *Tobacco Induced Diseases*, *15*, 13. https://doi.org/10.1186/s12971-017-0118-y

Saddleson, M. L., Kozlowski, L. T., Giovino, G. A., Goniewicz, M. L., Mahoney, M. C., Homish, G. G., & Arora, A. (2016). Enjoyment and other reasons for electronic cigarette use: Results from college students in New York. *Addictive Behaviors*, *54*, 33-39. https://doi.org/10.1016/j.addbeh.2015.11.012

Schreiber, L. R. N., Grant, J. E., & Odlaug, B. L. (2012). Emotion regulation and impulsivity in young adults. *Journal of psychiatric research*, *46*(5), 651-658. https://doi.org/10.1016/j.jpsychires.2012.02.005

Scott, A., Lugg, S. T., Aldridge, K., Lewis, K. E., Bowden, A., Mahida, R. Y., Grudzinska, F. S., Dosanjh, D., Parekh, D., Foronjy, R., Sapey, E., Naidu, B., & Thickett, D. R. (2018). Pro-inflammatory effects of e-cigarette vapour condensate on human alveolar macrophages. *Thorax*. https://doi.org/10.1136/thoraxjnl-2018-211663

Sirriyeh, R., Lawton, R., Gardner, P., & Armitage, G. (2012). Reviewing studies with diverse designs: the development and evaluation of a new tool. *Journal of Evaluation in Clinical Practice*, *18*(4), 746-752. https://doi.org/10.1111/j.1365-2753.2011.01662.x

Tackett, A. P., Lechner, W. V., Meier, E., Grant, D. M., Driskill, L. M., Tahirkheli, N. N., & Wagener, T. L. (2015). Biochemically verified smoking cessation and vaping beliefs among vape store customers. *Addiction*, *110*(5), 868-874.

Tice, D. M., Bratslavsky, E., & Baumeister, R. F. (2001). Emotional distress regulation takes precedence over impulse control: if you feel bad, do it! *Journal of Personality and Social Psychology*, *80*(1), 53-67.

Trumbo, C. W. (2018). Influence of risk perception on attitudes and norms regarding electronic cigarettes. *Risk Analysis*, *38*(5), 906-916. https://doi.org/10.1111/risa.12918

Trumbo, C. W., & Harper, R. (2015a). Orientation of US young adults toward e-cigarettes and their use in public. *Health Behavior Policy Review*, *2*(2), 163-170. https://doi.org/10.14485/hbpr.2.2.8

Trumbo, C. W., & Harper, R. (2015b). Perceived characteristics of e-cigarettes as an innovation by young adults. *Health Behavior Policy Review*, *2*(2), 154-162. https://doi.org/10.14485/hbpr.2.2.7

Trumbo, C. W., & Harper, R. (2016a). A comparison of students and non-students with respect to orientation toward e-cigarettes. *Journal of Public Health Research*, *5*(2), 595. https://doi.org/10.4081/jphr.2016.595

U. S. Public Health Service. (2016). *E-cigarette use among youth and young adults: A report of the surgeon general*.

Whittemore, R., & Knafl, K. (2005). The integrative review: Updated methodology. *Journal of Advanced Nursing*, *52*(5), 546-553. https://doi.org/doi:10.1111/j.1365-2648.2005.03621.x

2.0 Dissertation Proposal

Exploring the culture of young adults who use electronic cigarettes

Specific Aims

Electronic cigarette use, or vaping, rates are highest among young adults with rates more than doubling from 2013 to 2014 representing a significant upward trend in use (Allem, Forster, Neiberger, & Unger, 2015; U. S. Public Health Service, 2016). This trend raises concern in light of a recent outbreak of e-cigarette related lung injuries. As October 8th, 2019, 1299 cases have been identified and there are 26 confirmed deaths from 21 states (Siegel et al., 2019). Most, but not all, patient have reported using products containing THC, an active component of marijuana (*Outbreak of lung injury associated with e-cigarette use, or vaping*, 2019). Thirteen percent of the 573 patients suffering from e-cigarette or vaping associated lung injury (EVALI) reported using products that contained nicotine only products (Siegel et al., 2019), The content of the e-cigarette "juice" or liquid used in these cases continues to be investigated as no single causal agent has yet been pinpointed. What we do know about e-cigarette liquids is that current studies indicated that exposure to vaporized e-cigarette liquids causes inflammation and death to the lung tissue cells that capture inhaled dust and microorganisms; also, defense proteins associated with Chronic Obstructive Pulmonary Disease (COPD) are significantly elevated among e-cigarette users (Reidel, 2017).

Young adults make up 13.6% of current e-cigarette users (U.S. Department of Health and Human Services, 2016). Research describing young adult's knowledge, perceptions, and attitudes about e-cigarette use and identifying the qualities and characteristics of young adults who use e-cigarettes should focus on current e-cigarette users. For example, those who report daily use or who have used e-cigarettes at least once in the past 30 days. Yet, a current

integrative literature review (Tremblay et. al. under review) captured low numbers of current e-cigarette users; it included between 3% (Copeland, Peltier, & Waldo, 2017) and 35% (Pokhrel, Lam, Pagano, Kawamoto, & Herzog, 2018) of participants. Without research focused on current e-cigarette users, it is challenging to get an accurate sense of what is driving this health behavior, particularly in the age group of young adults who are disproportionately experiencing the current severe lung illnesses and deaths.

The purpose of the proposed study is to gain insight of cultural elements that influence e-cigarette use among young adults. The proposed study will include only participants aged 18 to 25 who currently use nicotine containing e-cigarettes, to capture the emic view of vaping, or perspective from within the social group. Young adults will be recruited via gatekeepers at vape shops, through social media, and by snowball method. Participants will be interviewed individually using a semi-structured guide. Additionally, the PI will observe communication, rules, and behaviors in the naturalistic spaces where young adults vape. These observations will provide the etic view, or perspective from the outside, to give context to emic data. The proposed study will be innovative in its use of a focused ethnographic approach, exploring the problem as a cultural phenomenon. From an ethnographic standpoint, commonalities of beliefs, values, and experiences may uncover a sub-culture associated with vaping behavior.

Aim 1: To understand the values, beliefs, and norms of young adults who vape.

Aim 2: To identify how cultural elements, such as vaping terms and other language, socialization to vaping, and social benefits related to e-cigarette use, are shared and communicated among young adults.

Aim 3: To explore the cultural identity of young adults who vape.

Understanding values, beliefs, and norms can guide public health campaigns focused on cessation and prevention. Identifying the language of how values, beliefs, and norms are transmitted can help create educational interventions specific to young adult e-cigarette users. Understanding cultural process can allow health researchers to develop mediating or moderating interventions that specifically address culture as a health behavior influence (Leininger & McFarland, 2006). Also, by understanding the culture associated with e-cigarette use among young adults, researchers can develop valid and reliable research instruments to better examine the social patterns and thoughts that contribute to the behavior. It is crucial to understand cultural influences that may support continued e-cigarette use despite the now known risks. Nurses and other health professionals can use an understanding of language seated in e-cigarette culture to develop a culturally competent approach to care and counseling.

Significance

Electronic Cigarettes

Electronic cigarettes also known as electronic nicotine delivery systems (ENDS) or "vapes," are an emerging public health threat. This threat is becoming more visible with recent severe pulmonary disease and deaths thought to be linked to e-cigarettes. Investigations are ongoing, but the cause has yet to be pin-pointed (*CDC, states investigating severe pulmonary disease among people who use e-cigarettes*, 2019; Prevention, 2019). Tests using human airway samples indicated that innate defense proteins associated with Chronic Obstructive Pulmonary Disease (COPD) were significantly elevated among ENDS users (Reidel et al., 2018). A more recent study by (Scott et al., 2018) indicated that acute exposure of unflavored vaporized e-liquids caused apoptosis and necrosis of alveolar macrophages in vitro. These findings indicated

that exposure to e-cigarette liquids in the vaporized state cause inflammation and death to the cells which capture inhaled dust and microorganisms.

According to the surgeon general, e-cigarettes are now more widely used than conventional cigarettes among youth, putting a whole new generation at risk for nicotine addiction (U.S. Department of Health and Human Services, 2016). In 2014, awareness of e-cigarettes reached 94.3% of the U. S. population (Huerta et al., 2017). Among young adults 18–24 years of age, e-cigarette use more than doubled from 2013 to 2014 reaching an ENDS use rate of 6.1% and a dual e-cigarette and cigarette use rate of 7.5% of the population (U. S. Public Health Service, 2016), making young adult use rate of usage the highest rates (Allem et al., 2015). The steep rise in use is a concern because most tobacco use begins in youth and young adulthood and because young adults are targeted for tobacco advertising and marketing by sellers (U.S. Department of Health and Human Services, 2012). Sellers of e-cigarette products utilize the same type of marketing strategies that were found to attract adolescents and young adults to traditional cigarettes. Despite e-cigarettes being successfully used as a cessation method for some (Tackett et al., 2015), e-cigarettes are more likely to create a 'gateway' effect to further future tobacco use for younger users (Leventhal et al., 2016). Understanding cultural aspects associated with the behavior in young adults may uncover the social mechanisms that underpin e-cigarettes use as a gateway to future tobacco use.

Recent attention has been given to flavoring in e-cigarettes, which is viewed favorably by young adults (Choi et al., 2012) and works as a reinforcement of vaping behavior (Audrain-McGovern et al., 2016). The Food and Drug Administration (FDA) banned flavored tobacco products such as combustible cigarettes, cigars, cigarellos, and chewing tobacco, because of

their potential attractiveness to children in 2009 (Administration, 2015). It was not until a 2016 ruling known as the "deeming act" stated that electronic nicotine delivery, such as e-cigarettes, systems could be regulated by the FDA as tobacco products, but only recently has the FDA recommended advancing laws to ban most flavors of e-liquids. The exceptions to the flavor ban are mint and menthol-flavorings, which are favored by adults, but ranked as far less popular by minors and young adults (Harrell et al., 2017). The ban of certain flavorings is aimed at reducing new users among youth and young adults while preserving an option for smoking cessation of traditional cigarettes by adults. However, it is vital to note that acute exposure of *unflavored* vaporized e-liquids caused apoptosis and necrosis of alveolar macrophages in vitro (Scott et al., 2018). E-cigarettes use among young adults is a significant trend in health behavior which is not yet fully understood.

Other substances like nicotine and diacetyl found in the vaporized liquid have known deleterious effects. Also, formaldehyde is a by-product of heating e-liquids (Jensen et al., 2015). Nicotine, an addictive substance, is known to have more significant effects on the brains of youth and young adults, including reduced impulse control, mood disorders, addiction, and impaired attention and cognition (U.S. Department of Health and Human Services, 2012). Nicotine absorption via the lungs when vaping is immediate, as with traditional smoking, and may create the same kind of dependence seen with traditional cigarettes (Schroeder & Hoffman, 2014). Formaldehyde is an IARC Class 1A carcinogen. Newer models of e-cigarettes burn at higher heats, producing higher levels of formaldehyde (Talih et al., 2016). Diacetyl, found in 39 out of 51 e-liquids tested by Allen et al. (2016), is used as a flavoring agent and can cause the irreversible lung disease bronchiolitis obliterans, or "popcorn lung" (Allen et al., 2016; Farsalinos et al., 2015).

Young Adults

The ages between 18 to 25 years are not only a unique time of life but are also unique to this generation living it. Delayed adoption of adult roles is a current aspect of young adult years from 18 to 25 (Arnett, 2000). The characteristics of the current generation in this age frame differ from that of their parents. Social norms are changing. The average age of first marriage was 20 for women and 24.7 for men in 1980, in 2017 is was 27.4 for women and 29.5 for men (United States Census Bureau, 2017). (Arnett, 2000) first described the years from 18 to 25 as emerging adulthood in order to capture the delayed adoption of adult roles. One characteristic of current young adults is exploration, which may include health behaviors. Characteristics of young adults who are more inclined to use e-cigarettes are those who identify young adulthood as a time of experimentation and those who have experienced multiple "role transitions" such as gaining or losing a job or a romantic partner (Allem et al., 2015). Another attribute of this age may be poor self- regulation of emotions, which has been linked to risky health behaviors such as smoking traditional cigarettes (Tice et al., 2001). One factor associated with this dysregulation is impulsivity, which may be a risk factor in using addictive substances, including nicotine (Schreiber et al., 2012). These characteristics of the young adult years and loci of influence are vital in understanding how e-cigarette use is socially and culturally accepted during the formative years in young adulthood.

Moreover, in recent studies, young adults indicated that they perceived a lower risk of harm from e-cigarettes than from traditional cigarettes. In the National Adult Tobacco Survey (NATS) conducted by the Center for Disease Control (CDC), the rate of flavored e-cigarettes use was highest among young adults (U.S. Department of Health and Human Services, 2012). A total of 91.6% of young adults who were current e-cigarettes users disclosed that they consumed

a flavored e-cigarette product (U.S. Department of Health and Human Services, 2012). Although McDonald and Ling (2015) indicated that participants perceived low risk of e-cigarettes, other studies indicated a lower *relative* risk (Maglalang et al., 2016). In other words, participants saw it as healthier, but not necessarily free of harm. Further, those who use both traditional cigarettes and e-cigarettes (dual users) reported lower perception of harm by e-cigarettes in one study (Cooper et al., 2017), whereas a second study showed no statistically significant difference in perceived harm between e-cigarette users, non-users and dual users (Copeland et al., 2017). However, Copeland et al. (2017) did indicate that current e- cigarette -users perceived more benefits to using e-cigarettes compared to those who had never tried them.

Recent research indicated that young adults felt they had limited knowledge about e-cigarettes and that there was a lack of evidence communicated to them by health professionals (McDonald & Ling, 2015). Misinformation may contribute to a perception that e-cigarettes are not harmful. Many young adults believed that the liquid used in e-cigarettes produced nothing more than water vapor (Case et al., 2016). Although 75.8% of the participants in a recent study recognized e-cigarettes as a tobacco product, current users were less likely to do so (Hart et al., 2017). Despite knowledge deficits among young adults about the health risks of vaping, health information on e-cigarettes use is emerging.

Further, the surgeon general concluded that adolescents and young adults are influenced by social and environmental cues toward tobacco use (U.S. Department of Health and Human Services, 2012). For example, attitudes of acceptance of traditional cigarette smoking among those who never smoked cigarettes were found to be higher in youth who lived with an e-cigarette user, were exposed to e-cigarette advertising, or who used e-cigarettes (Choi et al., 2017). Higher attitudes of acceptance may be one crucial factor to consider from a cultural

perspective, which speaks to tobacco use in youth and young adults. Culture includes the commonality of values and norms as well as their transmission through language and social cues.

Culture

Nurses have long understood the importance of providing culturally specific care to achieve optimal health outcomes for patients and populations. A pioneer in the field of cultural competence in nursing was nurse and anthropologist Madeline Leininger. Leininger's theory of culture care diversity and universality puts forth that explanation and prediction of health can only be achieved by uncovering meanings, patterns and processes embedded within a person's culture (Leininger, 1988). Uncovering knowledge and information that a population holds can inform researchers about social patterning previously unknown or not understood (Polit & Beck, 2008). Qualitative research provides insight into reasons for these social patterns that could only previously be guessed (Munhall, 2012). Culture encompasses the internalized shared beliefs, knowledge, and behaviors through which a group views their individual and collective experiences (Kagawa Singer et al., 2016). Culture applies to individuals, groups, and broader society; it evolves with group members and is often tacit to its members. Culture is an internalized way of seeing and being in the world. To understand the culture is to uncover the participants world view through the language they use, concepts they express, and the way they communicate (Polit & Beck, 2008). Culture is reflected not only in characteristics, such as knowledge, attitudes, and perceptions of young adults but also how those elements are transmitted from one individual to another. Understanding cultural or sub-cultural process can allow health researchers to develop mediating or moderating interventions that specifically address culture as a health behavior influence (Leininger & McFarland, 2006).

Though current research has begun to explore knowledge, attitudes, and perceptions of young adults around the topic of vaping, it does not include searching for a deeper meaning of the behavior nor is there an exploration of the language used when sharing ideas about vaping. Meaning, shared ideas, and shared language may illuminate a cultural aspect of vaping behavior which influences the knowledge, attitudes, and perceptions. (Kagawa Singer et al., 2016).

Adding to the complexity of identifying tacit cultural indicators of this health behavior, is the cultural branding of e-cigarettes. Cultural branding intentionally builds myths or stories of experiences that lead consumers to buy a specific product so they can experience the 'story' for themselves (Holt, 2004). Thus, research is necessary to identify components of culture that may influence health behaviors. Looking at an emerging health behavior through a cultural lens can lend a unique perspective to nurses, and other health care professionals, in how to develop culturally congruent care that is specific to this population of young adult e-cigarette users.

Gaps in the Current Literature

Gaps in the current studies that have investigated the characteristics and experiences of young adults who use e-cigarettes (Cooper et al., 2016; McDonald & Ling, 2015; Trumbo & Harper, 2013) include an emic view of the behavior due to the limited amount of currently vaping young adult participants within the studies, a lack of investigation of communication and language, and an omission of the influence of social context on this health behavior.

First, the current literature on this topic is limited due to characteristics within population samples. Proportions of study participants who were *current* e-cigarette users ranged from a low of 3% (Copeland et al., 2017) to a high of 35% (Pokhrel et al., 2018) in study samples of young adults. Underrepresentation of current e-cigarette users means that the emic perspective was not fully captured. The emic perspective, or "insider's view" is vital in creating a clear picture of

the issue. As (Spradley, 1979) noted, explanations of behavior that exclude what the participants know about themselves are only partial and distort our knowledge about the situation. Second, no studies were found that discussed language or communication that is specific to e-cigarette use in the young adult population. (Alexander et al., 2016) conducted a study exploring e-cigarette use and products in the general adult population and indicated that language is used to create conceptual clarity and is vital to understanding culture. Third, social context or environment can influence health behaviors. Though demographics have been collected in previous studies, there have been no studies that explore the shared environments or social contexts where young adults vape.

These gaps in the current literature illustrate the need for further study. Emic knowledge acquisition will be achieved through the use of a focused ethnographic approach. From an ethnographic standpoint, commonalities of beliefs, values, and experiences may uncover a sub-culture associated with vaping behavior. No current studies of young adults whom vape have used a focused ethnographic approach. Addressing these gaps using a focused ethnography will benefit nursing and other health practitioners by exploring the social context and meaning of e-cigarette use by young adults to the people using them. In keeping with Leininger's culture care theory and transcultural nursing, nursing care should be culturally sensitive (Leininger & McFarland, 2002, 2006). Not only do cultural influences affect health behavior, but they can also influence treatment and adherence. Thus, social context and meaning of health behaviors are foundational to effective care.

Proposed Study

The proposed study will address the above gaps in the current literature and add to the body of nursing knowledge in three distinct ways. First, the study will inform nursing practice by

providing a unique cultural perspective not previously captured in research. Second, by understanding how this group shares beliefs and values, nursing and other health professionals can tailor assessment, care, and counseling. Understanding values and beliefs promote empathy and therapeutic communication so young adults feel understood by caregivers and are less likely to withhold information. Without an understanding of the meaning of e-cigarette use to young adults, nurses and other health professionals may miss the ability to provide appropriate care to this population. Additionally, by understanding the shared values and beliefs, nurses can be alerted to youth and young adults at risk for e-cigarette initiation and take preventative measures. Third, understanding language and meaning associated with e-cigarettes informs and directs public health education/campaigns that will resonate with the target population. To affect halting or decreasing the recent rise in e-cigarette use, which is associated with a rise in other tobacco products as well, nurses and public health officials need to include the perspective of ENDS users. If we understand what e-cigarette use means to individuals, nurses can align health messages with the young adult's values, including effectively dispelling misinformation about e-cigarettes.

Innovation

The proposed study is innovative in its goal, participant sample, and methodology. First, the proposed study is the first to focus on exploring the cultural aspects of vaping behavior in young adults. A focused ethnography is ideal for capturing social behaviors, patterns, and meaning from a personal perspective that has not been reported in the literature (Robinson, 2013). This study will build on previous studies that explored knowledge, attitudes, and perceptions of young adults, but that did not draw their samples exclusively from current e-cigarette users or explore aspects of their culture. Although understanding the knowledge,

attitudes, and perceptions of the young adults in general is informative, it does not allow for the fuller picture of what meaning the behavior has in the lives of young adults who vape, the nature of social benefits or stigmas they have experienced, or whether the behavior connects them to a broader community or subculture of others who vape.

Second, there is a paucity of literature exploring characteristics of young adults who use e-cigarettes from the perspective of the participants engaged in the behavior. Current studies that explore e-cigarette use have drawn from the young adult population as a whole. As Spradley (1980) noted, excluding those participating in the behavior will offer only a partial explanation. With a limited percentage of current e-cigarette users being studied, the explanation of the behavior and its meaning to those engaged in it is limited and possibly distorted. Thus, finding out what current e-cigarette users within the young adult population know, perceive, and experience will be vital to building a complete understanding of the phenomenon.

Third, the proposed study will be the first to use focused ethnography to explore the issue. When current evidence is thin, using a novel approach to the problem can elucidate yet unknown data (Munhall, 2012). By using a focused ethnographic approach, data collection will extend beyond the interview process and will include ethnographic observational data from the spaces where young adults vape. These spaces, such as vape shops or "lounges," frequently include features that promote socialization within the shop (e.g., cafes or pool tables), encouraging e-cigarette users to spend time and interact with others who vape (U.S. Department of Health and Human Services, 2016). Focused ethnography explicitly studies a phenomenon from the perspective of revealing aspects of culture, which are a basis for behavior. Currently, no studies have captured this data. Observations in this setting may uncover components of language and transmission of values, beliefs, and norms. Observations add contextual data not

yet captured in the current literature. Explicating what is now tacit knowledge about the culture of ENDS use by young adults and its influence on health behaviors will be invaluable in developing culturally congruent care for this population. Specifically, care should include primary prevention practices such as education using words and images that are meaningful to young adults. Secondary preventative care should include routine screening for all tobacco use including e-cigarettes, counseling, and tobacco cessation planning.

To summarize, this proposed study will address an emergent public health issue by elucidating the subculture of vaping from the perspective of the members of that community. A focused ethnographic approach is an innovative approach to the emerging health trend of e-cigarette use by young adults. Focused ethnography is an appropriate method for uncovering values, beliefs, and norms of the participants which have not yet been fully explored from the perspective of young adults currently using e-cigarettes.

Approach

Preliminary Study

The proposed study will expand upon a qualitative mini-study conducted in the fall of 2017 as part of graduate coursework at Duquesne University School of Nursing.

Participants were recruited in southeastern Virginia, where the PI lives, via purposive and snowball method for a focused ethnography mini-study of young adults who currently vape (N = 4) including three males and one female. Data were collected by audio-recording semi-structured interviews over four months, which were transcribed into NVivo 11 software. Leininger's phases of data analysis guided analysis (McFarland, 2012). The descriptors and components were categorized. Patterns were identified from the categories. Ten categories were identified, and three patterns subsequently emerged: Feeling Shamed about Vaping, Uncertainty

of Health Implications, and Positive Sensory Experiences. Participants expressed being shamed for vaping, and some expressed embarrassment about the behavior. Findings were similar to published research, such as the belief that vaping is less of a health risk than smoking (Case, Crook, Lazard, & Mackert, 2016; Cooper, Loukas, Harrell, & Perry, 2017; Maglalang, Brown-Johnson, & Prochaska, 2016; 2018) and liking the flavor and the "buzz" experience (Lee, Lin, Seo, & Lohrmann, 2017; McDonald & Ling, 2015).

Although the number of participants was not large enough to achieve data saturation or fully develop themes, the findings suggest need for further study. One category that emerged (feeling shamed about vaping) may speak to a possible sub-cultural context associated with the behavior. Further study of how young adults who use e-cigarettes see themselves in the larger world as opposed to with others who vape may illuminate some aspect of the participants "life ways" or practices that relate to culture (McFarland, 2012). The other two patterns that emerged (uncertainty of health implications and positive sensory experiences) echoed themes in current literature but were not fully explored from young adults currently using e-cigarettes. This study supports the need for further exploration of the cultural aspects of vaping among young adults that includes the insider's (emic) perspective.

Research Methodology

This proposed study will also use a focused ethnographic qualitative research approach with a critical realist lens. Critical realism emanated from the philosophical writings of Roy Bhaskar from the mid 1970's through the 1990's. The term critical realism developed from Bhaskar's phrases 'transendental realism' and 'critical naturalism'. The word critical gives a nod to the work of Kant while the word realism highlights the differences from Kantian philosophy (Archer et al., 2013). Critical realism integrates both realist ontology and constructivist

epistemology (Creswell & Planco Clark, 2011). Where realist ontology stated that there is a real world outside of humans' ideas and perceptions, constructivist epistemology recognized that human's understanding of the world must be built from one's own perspective within the world (Creswell & Planco Clark, 2011). Thus, the philosophical foundation of critical realism meshes well with focused ethnography, which seeks to include both etic and emic components to find the truth. Explicitly targeting young adults currently engaged in vaping behavior will increase our understanding of their beliefs, values, and norms; these components build culture when shared with others. Thus, this proposed study will include an exploration of language and communication within the young adult population. The focused ethnographic approach will include observation of ENDS users within the spaces where young adults vape and purchase vaping products.

By including observations and interviews as data sources, or the etic and emic sources described above, the researcher addresses internal validity via triangulation (Barbour, 2001). Qualitative research is an inductive research method informed by several disciplines, including anthropology (Richards & Morse, 2007). An overarching goal of a qualitative study is to reveal tacit knowledge of a population.

Research Design

The proposed study will use a focused ethnography method with a realist lens. This lens will allow the experiences and perspectives of the participants to be viewed via a real-world context. Ethnography is a qualitative research design which is conducted by the researcher as both participant and observer and focuses on understanding the culture from the emic perspective (Richards & Morse, 2007). Focused ethnography is derived from ethnography, but can be used to study subcultures, one aspect of a participant's life, or an issue that exists within the broader

society (Munhall, 2012). In a focused ethnography, the experience of the participants from their perspective is vital (Munhall, 2012). Participant interviews take on a larger importance than the traditional fieldwork of ethnography. Unlike traditional ethnography, participation by the researcher is not part of a focused ethnographic study, only observation (Richards & Morse, 2007).

Researcher observations as "field notes" will also add to the study as an 'etic' component adding further insight into the emic view (Munhall, 2012). The researcher becomes the instrument in a focused ethnography (Creswell & Planco Clark, 2011). Field notes will consist of researcher observations of participants and spaces such as vape shops and vape lounges. With permission from shop owners or managers, photographs of the empty spaces will be taken. Photos will not include any individuals. Observation will build the etic component of the focused ethnography. The emic piece of the study will be fulfilled through semi-structured interviews conducted by the principal investigator with participants. The semi-structured interview guide of open-ended questions will be used to enable participants to share their beliefs, values, and experiences about using e-cigarette products and any cultural identity young adults may share. Respectively, these are the first and third aims of this study. In addition, open-ended questions will explore how participant's beliefs, values, and experiences about e-cigarette use are shared and transmitted to others. Inclusion of these open-ended questions speaks to the study's second aim of identifying how cultural elements related to e-cigarette use are shared and communicated among young adults.

In this proposed focused ethnography, the principal investigator will conduct observations in spaces where e-cigarette products are purchased and used, such as vape shops and lounges. Objective observation of these spaces and the possible influences within the spaces

that may affect socialization or perception of e-cigarettes will provide etic data. . For example, the PI will spend time in vape shops and lounges observing interactions with vape shop employees and other consumers. These observations will illuminate the social context, or social environment which may contribute to the health behavior of using e-cigarettes. These elements may include advertisements and marketing within the space, from the manufacturing company or attractiveness of displays. The space will be assessed for other factors that promote socialization within the shop or lounge, such as games or seating areas. Observations will include how customers use these physical elements. This etic data will provide context to interview data. The emic data will be drawn from semi-structured interviews with young adults who vape. The etic and emic data will be integrated iteratively throughout data collection to construct a holistic and accurate understanding of the explicit and tacit components of young adults who use e-cigarettes. The anticipated timeline for observations and interviews is six months for this proposed study.

Setting and Sample

This proposed study focuses on young adults, aged 18 to 25, who currently use electronic cigarettes, vaporizers, or other electronic nicotine delivery systems. Although there is current research in this age group about e-cigarette use, the sample population is more often drawn from young adults as a whole rather than from young adults who currently use e-cigarettes. Further, motivations for e-cigarette use and subsequent tobacco use have not been fully explored from the emic perspective. Inclusion criteria are young adults who are between the ages of 18 and 25 years of age who currently use an e-cigarettes. Current vape usage will be defined as use within the last 30 days. Using 30 days as the criterion for "current" usage is commonly accepted for tobacco and electronic nicotine delivery system (e-cigarette) research (U.S. Department of Health and Human Services, 2016). For this study, I will seek out young adults who are not only

current users, but who are regular users. For the purpose of this study, I will define regular e-cigarette users as those who use e-cigarettes at least three times a week for the last 6 months. Flyers will be used to recruit participants in the PI's home state of Virginia. Further by distributing the flyer through social media, such as Facebook personal and group pages.

The setting for ethnographic observations will be vape shops or vape lounges. Observation at a minimum of ten shops will be included though the PI will visit a minimum of 30 shops to observe commonalities and differences. Criteria for choosing to complete observations at a shop will include permission from management and whether the shop has elements that include socialization, such as furniture or games. Since vape shops are prevalent and are places of business, vape shop owners and managers will be asked permission for the primary researcher to spend time in the vape shop observing, to take photographs of the space, and to leave recruitment fliers for patrons. Shop owners and managers, in this way, will become gate-keepers and may facilitate recruitment of eligible participants. Additional locations where young adults vape will be scouted and included in the observations. Sites may include college campuses, outside coffee shops, concerts, bars and other locations where young adults congregate.

Recruitment

Using an IRB- approved protocol, the study sample will be recruited through purposive sampling methods, including contacting gatekeepers (shop owners) and through snowball method. The snowball technique is also known as network sampling and means that earlier participants can refer potential participants to the study (Polit & Beck, 2008). Purposive sampling is a non-probability method of participant selection where the researcher selects participants who will be likely to be able to contribute to the study (Polit & Beck, 2008). This

sampling method will be employed by seeking participants through use of flyers placed in places where young adults may frequent – such as coffee shops, vape shops, college campuses, and vocational training centers, with permission from those sites. The flyer will include basic information, including about the researcher, the target population, time commitment and compensation, and how to contact the researcher. The flyer information will also be shared via social media forums such as Facebook using a "public" setting which can be shared.

One lesson learned in the pilot study regarded the method of how 18-25 year-olds preferred to contact the researcher. All participants stated that they preferred to use text messaging to communicate and were uncomfortable with using audio phone calls. Therefore, the flyer will ask potential participants to either call or to text the word VAPE to the researcher's mobile phone number. The researcher will then confirm that the potential participant meets inclusion criteria and set up an interview at a location of the participant's choice at a mutually convenient time. Locations may include libraries, coffeeshops, or vape shops near the participant's home location.

When the participant contacts the researcher to set up an interview, a brief overview of the study, compensation, and right to withdraw at any time will be given. At the time of the meeting, before the interview takes place, informed consent will be obtained. Informed consent will be provided in writing (see Appendix C) and will be verbally reviewed with the participant before the interview process. The purpose of the study will be explained to the participants as well as that privacy and confidentiality will be maintained. Participants will again be informed that they may discontinue their participation in the study at any point. Any participant questions will be answered to their satisfaction before proceeding with the interview. After the interview, participants will receive a 20 dollar gift card to Target.

Data Collection

First, data will be collected by recording ethnographic notes of the researcher's observations of spaces where e-cigarettes are purchased and used. A variety of sites will be visited and elements that may encourage socialization, such as presence of sitting areas or games, will be identified as spaces where observations will take place. Specifically, the physical spaces will be recorded for items that may influence young adults such as prominent advertisements and marketing displays. Also, the layout of the shop or lounge and inclusion of areas that promote socialization such as seating areas or pool tables will be recorded. Lastly, interactions between customers and shop keepers in general and specific to vaping and vaping products will be recorded, transcribed, and coded for analysis. Direct observations will be used together with a semi-structured interview guide partially derived from the mini-study to develop open-ended questions to ascertain meaning to participants (See Appendix A). Interviews are anticipated to last approximately 60 to 90 minutes. With consent from the participant, interviews will be recorded using an audio recorder and transcribed by the primary investigator (PI). Some participants may be identified as key informants, or expert sources, and asked for a second interview to clarify or expand upon information collected in other interviews. Key informants are those who those individuals with unique knowledge and understanding in one or more areas such as their role within the community, their level of knowledge, their willingness to communicate with the researcher, their ability to communicate their knowledge in an understandable way, and their ability to remain objective and unbiased (Marshall, 1996). Recruitment and interviewing will occur until data saturation is established. Data saturation can be assumed when no new information emerges from new data (Polit & Beck, 2008). An initial goal of 20 to 25 participants will be set, though there is no set minimum number of participants

in focused ethnographic research. As (Guest et al., 2006) noted in their guidelines for studies using purposive sampling, the sample size is dictated by data saturation.

In addition to the verbal interview, demographic data will be collected in a separate written questionnaire (see Appendix B). Demographic data will include information about self-identified gender, employment or student status, personal income range, parental income range, living situation (dorm, parent's home, independent), and history of tobacco use, and current additional tobacco product use. The semi-structured interview guide developed from the pilot study mentioned earlier will be used as a starting point to uncover the values, beliefs, and norms of the sample, and collected data will guide future interviews also. Data collection and analysis will occur concurrently.

The researcher will iteratively analyze interview and observation data, with the addition of any new data, to assess if data saturation has been achieved. The iterative process is reflexive data analysis and is an inductive method for identifying emerging categories, patterns, and themes. By viewing the data as a whole after each new addition of data, the researcher gains insights and understanding of the meaning (Srivastava & Hopwood, 2009).

Data Analysis

Leininger's Phases of Qualitative Data Analysis will be used in data analysis (McFarland, 2012). Data collection and analysis will occur concurrently. Raw data will be collected and documented through field notes, photographs of vape shops and lounges, and audio-recordings of semi-structured individual interviews. In the second phase, interviews will be transcribed into a qualitative software, NVivo 12. The focus during data analysis will be on categorizing data using

the study purpose, and the research questions. The researcher will also identify saturation of ideas and recurrent patterns of values, beliefs, experiences, and practices based on the interview data as well as from field notes to add to the contextual data. Photographs will add to the environmental data The researcher will identify any major themes that arise, research findings, and patterns of practice. A "thick description", which includes the researchers etic understanding of the patterns within the social context, will be developed from the categories developed from ethnographic inference. Data will be investigated for and categorized according to its ability to address the three aims of this study as well as for yet unknown patterns and discovery of additional new data:

- **Aim 1:** To understand the values, beliefs, and norms of young adults who vape.
- **Aim 2:** To identify how subcultural elements, such as vaping terms and other language, socialization to vaping, and social benefits related to e-cigarette use are shared and communicated among young adults.
- **Aim 3:** To explore the cultural identity of young adults who vape.

Rigor

Each discipline that informs qualitative research developed specific methods for addressing questions of interest; however, commonalities between methods exist (Polit & Beck, 2008). These commonalities are included in Table 1.

(Creswell & Planco Clark, 2011) suggest several measures to increase the rigor of qualitative research studies. These tenets have been combined with other established concepts that promote the study's rigor (Barbour, 2001). The concepts to promote rigor and how they will be addressed in the proposed study are detailed in Table 1.

Table 1

Concepts for supporting rigor in qualitative research with the proposed approach

Concepts supporting Rigor	How concepts will be addressed in this study
Member Checking	Key informants will be identified. Summaries of findings will be shared with key informants to assess the accuracy of findings
Disconfirming evidence	Include participant data that does not align with major themes
External Auditors	Methodology expert on dissertation committee
Data Trails	Transparency of documentation in the form of a. Field notes b. Reflective journal c. Transcriptions of interviews will be shared with the dissertation committee to establish trustworthiness.
Dependability	Investing sufficient time in interviews, utilization of key informants, and ensuring data saturation.
Triangulation	Observational field notes with individual interview data
Multiple data sources	Photographs of spaces where ENDS products are purchased and used. Semi-structured interviews; field notes
Heterogenous sample	Use of purposive sampling in multiple regions
Researcher as Key Instrument	The primary investigator will conduct all observations and interviews The primary investigator will keep a nightly journal of reflections.
Inductive Data Analysis	Use Leininger's data analysis for coding to uncover categories, patterns, and themes
Theoretical Lens	Realism
Interpretive Inquiry	Findings of the participants' interpretations of their experiences will be presented
Holistic account	Through open-ended questions and objective observations.

Adapted from "Checklists for improving rigour in qualitative research: a case of the tail wagging the dog?" by Barbour, R. S. (2001). *BMJ (Clinical research ed.), 322*(7294), 1115-1117; "*Designing and Conducting Mixed Methods Research*"(2nd edition ed.) by Creswell, J. W., & Planco Clark, V. L. (2011). California: Sage; "*Nursing Research: Generating and Assessing Evidence for Nursing Practice"* (8th ed.). by Polit, D. F., & Beck, C. T. (2008). Philidelphia, PA: Lippincott Williams & Wilkins.

Study Limitations

As a qualitative study, findings are not intended to be generalizable, though findings may be transferable. A second potential study limitation includes bias. One technique used to address bias in qualitative research and ensure an objective analysis is for multiple researchers to code independently. This technique is similar to inter-rater reliability in quantitative research methods. To combat the potential bias, a qualitative methodological expert will review the primary investigator's data sources and coding to identify errors and discuss interpretations.

Potential barriers

Potential barriers for this study are primarily recruitment barriers related to comfort of potential participants and changing laws affecting legal age for buying e-cigarettes. The use of flyers and snowball method relies on the participants to make contact with the researcher. Having potential participants initiate contact may deter some people, who are self-conscious or shy, from participation. Barriers in data collection may come from shop owners or managers not wanting a researcher to observe as they may feel it will be a deterrent to business. The primary investigator will answer all questions about the study with potential gatekeepers to build rapport. The PI will also discuss the observational and non-judgmental nature of the study. Further, participants may not feel comfortable with having an audio recording of the interview and may either refuse or edit themselves, knowing they are being recorded. Permission for audio recording will be asked prior to beginning recording. The PI will explain that the recording is used by the researcher to represent the participant accurately. After the interview is transcribed and the research project is complete, the recordings will be erased. The recording device used

will be small so as not to provide a distraction during the interview. Another potential barrier may include a recent change in Virginia law that restricts the sale of Vaping products to adults at least 21 and over ("Tobacco products, nicotine vapor products, etc.; purchase, possession, and sale," 2019). A solution to overcoming this potential barrier is to recruit from sites that are not age restricted which young adults frequent, such as coffee shops and college campuses. Also, the information in the flyer will be posted via social media, such as Facebook and Instagram, and asked to be shared by other users of the platform.

Protection of Research Participants

Participants will experience no risks greater than those encountered in everyday life. Participants' names will not appear on any survey or research instruments. No identity will be made in the data analysis. Each participant will create a unique identifier which the researcher will use to locate the participants' specific data should they request to be removed from the study. All audio data will be stored using encrypted software and stored on a password-protected computer. The demographic form and informed consent will be kept in a locked cabinet. Transcribed materials will have no name identification and will be stored in the protected analysis software, NVivo 12 using a password protected computer. All materials will be destroyed three years after the completion of the research. Participants are under no obligation to participate in this study. They are free to withdraw at any time and for any reason by contacting the researcher and requesting a withdrawal from the study. All consent will be voluntary.

Timeline

The timeline for this proposed study totals 10-12 months. The first month will include seeking approval from the Institutional Review Board (IRB) at Duquesne University. As this proposed study is an expansion of the prior mini-study approved in an expedited review, the

researcher will seek to amend the aforementioned approved protocol, which has been kept open. If an amendment is not granted, the study will be submitted for new expedited review. An expedited review is appropriate as this study poses no risks beyond those experienced in everyday life. Once the study is approved by the IRB, recruitment and observation of spaces where young adults purchase and use ENDS will begin. Subsequently, interviews will begin at the first opportunity after informed consent has been obtained. Recruitment, observations, and interviews will overlap. The researcher anticipates between eight and nine months to complete observations and interviews, though this is ultimately dependent upon data saturation. Coding for categories, patterns, and themes will begin with the first data gathered and will continue as an iterative process with each new data. Thus, analysis is expected to take 8 to 10 months. See Table 2 for a visual representation of timeline plan.

Table 2

Study Timeline 2020

Task	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**
IRB approval	X										
Recruitment		X	X	X	X	X	X	X	X		
Observation		X	X	X	X	X	X	X	X		
Interviews			X	X	X	X	X	X	X	X	
Analysis		X	X	X	X	X	X	X	X	X	X
Dissemination											X

References

U.S. Food and Drug Administration (2015). *What are the FDA's policies on flavored tobacco?* https://www.fda.gov/AboutFDA/Transparency/Basics/ucm208085.htm

Alexander, J. P., Coleman, B. N., Johnson, S. E., Tessman, G. K., Tworek, C., & Dickinson, D. M. (2016). Smoke and Vapor: Exploring the terminology landscape among electronic cigarette users. *Tobacco Regulatory Science*, *2*(3), 204-213. https://doi.org/10.18001/trs.2.3.1

Allem, J.-P., Forster, M., Neiberger, A., & Unger, J. B. (2015). Characteristics of emerging adulthood and e-cigarette use: Findings from a pilot study. *Addictive Behaviors*, *50*, 40-44. https://doi.org/https://doi.org/10.1016/j.addbeh.2015.06.023

Allen, J. G., Flanigan, S. S., LeBlanc, M., Vallarino, J., MacNaughton, P., Stewart, J. H., & Christiani, D. C. (2016). Flavoring chemicals in e-cigarettes: Diacetyl, 2,3-pentanedione, and acetoin in a sample of 51 products, including fruit-, candy-, and cocktail-flavored e-cigarettes. *Environmental Health Perspectives*, *124*(6), 733-738. https://doi.org/10.1289/ehp.1510185

Archer, M., Bhaskar, R., Collier, A., Lawson, T., & Norrie, A. (2013). *Critical realism: Essential readings* (Routledge, Ed.)

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American psychologist*, *55*(5), 469.

Audrain-McGovern, J., Strasser, A. A., & Wileyto, E. P. (2016). The impact of flavoring on the rewarding and reinforcing value of e-cigarettes with nicotine among young adult smokers. *Drug and Alcohol Dependence*, *166*, 263-267. https://doi.org/https://doi.org/10.1016/j.drugalcdep.2016.06.030

Barbour, R. S. (2001). Checklists for improving rigour in qualitative research: A case of the tail wagging the dog? *British Medical Journal (Clinical research ed.)*, *322*(7294), 1115-1117.

Case, K., Crook, B., Lazard, A., & Mackert, M. (2016). Formative research to identify perceptions of e-cigarettes in college students: Implications for future health communication campaigns. *Journal of American College Health*, *64*(5), 380-389. https://doi.org/10.1080/07448481.2016.1158180

CDC, states investigating severe pulmonary disease among people who use e-cigarettes. (2019, August 17, 2019). https://www.cdc.gov/media/releases/2019/s0817-pulmonary-disease-ecigarettes.html

Choi, K., Fabian, L., Mottey, N., Corbett, A., & Forster, J. (2012). Young adults' favorable perceptions of snus, dissolvable tobacco products, and electronic cigarettes: findings from a focus group study. *American Journal of Public Health*, *102*(11), 2088-2093. https://doi.org/10.2105/ajph.2011.300525

Choi, K., Grana, R., & Bernat, D. (2017). Electronic nicotine delivery systems and acceptability of adult cigarette smoking among florida youth: Renormalization of smoking? *Journal of Adolescent Health*, *60*(5), 592-598. https://doi.org/https://doi.org/10.1016/j.jadohealth.2016.12.001

Cooper, M., Harrell, M. B., Perez, A., Delk, J., & Perry, C. L. (2016). Flavorings and perceived harm and addictiveness of e-cigarettes among youth. *Tobacco Regulatory Sciemce*, *2*(3), 278-289. https://doi.org/10.18001/trs.2.3.7

Copeland, A. L., Peltier, M. R., & Waldo, K. (2017). Perceived risk and benefits of e-cigarette use among college students. *Addictive Behaviors*, *71*, 31-37. https://doi.org/10.1016/j.addbeh.2017.02.005

Creswell, J. W., & Planco Clark, V. L. (2011). *Designing and Conducting Mixed Methods Research* (2nd edition ed.). Sage.

Farsalinos, K. E., Kistler, K. A., Gillman, G., & Voudris, V. (2015). Evaluation of electronic cigarette liquids and aerosol for the presence of selected inhalation toxins. *Nicotine and Tobacco Research*, *17*(2), 168-174. https://doi.org/10.1093/ntr/ntu17610.1093/ntr/ntu176. Epub 2014 Sep 1.

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough?: An experiment with data saturation and variability. *Field Methods*, *18*(1), 59-82. https://doi.org/10.1177/1525822X05279903

Harrell, M. B., Weaver, S. R., Loukas, A., Creamer, M., Marti, C. N., Jackson, C. D., Heath, J. W., Nayak, P., Perry, C. L., Pechacek, T. F., & Eriksen, M. P. (2017). Flavored e-cigarette use: Characterizing youth, young adult, and adult users. *Preventive Medicine Reports*, *5*, 33-40. https://doi.org/https://doi.org/10.1016/j.pmedr.2016.11.001

Hart, E. P., Sears, C. G., Hart, J. L., & Walker, K. L. (2017). Electronic cigarettes and communication: An examination of college students' perceptions of safety and use. *Kentucky Journal of Communication*, *36*(1), 35-51.

Holt, D. (2004). *How brands become icons: The principles of cultural branding*. Harvard Busines School Press.

Huerta, T. R., Walker, D. M., Mullen, D., Johnson, T. J., & Ford, E. W. (2017). Trends in e-cigarette awareness and perceived harmfulness in the U.S. *American Journal of Preventive Medicine*, *52*(3), 339-346. https://doi.org/10.1016/j.amepre.2016.10.017

Jensen, R. P., Luo, W., Pankow, J. F., Strongin, R. M., & Peyton, D. H. (2015). Hidden formaldehyde in e-cigarette aerosols. *The New England Journal Of Medicine*, *372*(4), 392-394. https://doi.org/10.1056/NEJMc1413069

Kagawa Singer, M., Dressler, W., George, S., Baquet, C. R., Bell, R. A., Burhansstipanov, L., Burke, N. J., Dibble, S., Elwood, W., Garro, L., Gravlee, C. C., Guarnaccia, P., Hecht, M. L., Henderson, J., Hruschka, D., Lewis-Fernández, R., Like, R., Mouton, C., Myers, H. F., Page, J. B., Pasick, R., Pescosolido, B., Schoenberg, N., Stoner, B., Strayhorn, G., Szalacha, L., Trimble, J., Weisner, T. S., & Williams, D. (2016). Culture: The missing link in health research. *Social Science & Medicine*, *170*, 237-246. https://doi.org/https://doi.org/10.1016/j.socscimed.2016.07.015

Leininger, M. M. (1988). Leininger's theory of nursing: cultural care diversity and universality. *Nursing Science Quarterly*, *1*(4), 152-160.

Leininger, M. M., & McFarland, M. R. (2002). *Transcultural nursing : Concepts, theories, research and practice*. McGraw-Hill, Medical Pub. Division.

Leininger, M. M., & McFarland, M. R. (2006). *Culture care diversity and universality a worldwide nursing theory* (2nd ed.. ed.). Sudbury, MA : Jones and Bartlett.

Leventhal, A. M., Stone, M. D., Andrabi, N., Jessica Barrington-Trimis, P. D. R. S., PhD, Steve Sussman, P., & Janet Audrain-McGovern, P. (2016). Association of e-cigarette vaping and progression to heavier patterns of cigarette smoking. *Journal of the American Medical Association*, *316*(18), 1918-1920. https://doi.org/10.1001/jama.2016.14649

Marshall, M. N. (1996). The key informant technique. *Family Practice*, *13*(1), 92-97.

McDonald, E. A., & Ling, P. M. (2015). One of several 'toys' for smoking: young adult experiences with electronic cigarettes in New York City. *Tobacco Control*, *24*(6), 588-593. https://doi.org/10.1136/tobaccocontrol-2014-051743

McFarland, M. M., Sandra & Wehbe-Alamah, Hiba & Burk, Renee. (2012). Ethnonursing: A qualitative research method for studying culturally competent care across disciplines. *International Journal of Qualitative Methods*, *11*. https://doi.org/10.1177/160940691201100306.

Munhall, P. L. (2012). *Nursing research: A qualitative perspective* (5th edition ed.). Jones & Bartlett Learning.

Outbreak of lung injury associated with e-cigarette use, or vaping. (2019, October 3, 2019). Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion. Retrieved October 4, 2019 from https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html

Pokhrel, P., Lam, T. H., Pagano, I., Kawamoto, C. T., & Herzog, T. A. (2018). Young adult e-cigarette use outcome expectancies: Validity of a revised scale and a short scale. *Addictive Behaviors*, *78*, 193-199. https://doi.org/10.1016/j.addbeh.2017.11.019

Polit, D. F., & Beck, C. T. (2008). *Nursing research: Generating and assessing evidence for nursing practice* (8th ed.). Lippincott Williams & Wilkins.

Prevention, C. F. D. C. a. (2019). *Outbreak of lung disease associated with e-cigarette use, or vaping*

https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html

Reidel, B., Radicioni, G., Clapp, P. W., Ford, A. A., Abdelwahab, S., Rebuli, M. E., Haridass, P., Alexis, N. E., Jaspers, I., & Kesimer, M. (2018). E-cigarette use causes a unique innate immune response in the lung, involving increased neutrophilic activation and altered mucin secretion. *Amercican Journal of Respiratory and Critical Care Medicine*, *197*(4), 492-501. https://doi.org/10.1164/rccm.201708-1590OC

Richards, L., & Morse, J. M. (2007). *Read me first: User's guide to qualitative methods* (2nd ed.). Sage Publications Ltd.

Robinson, S. (2013). The relevancy of ethnography to nursing research. *Nursing Science Quarterly*, *26*(1), 14-19.

Schreiber, L. R. N., Grant, J. E., & Odlaug, B. L. (2012). Emotion regulation and impulsivity in young adults. *Journal of psychiatric research*, *46*(5), 651-658. https://doi.org/10.1016/j.jpsychires.2012.02.005

Schroeder, M. J., & Hoffman, A. C. (2014). Electronic cigarettes and nicotine clinical pharmacology. *Tobacco Control*, *23*(S2), ii30-35. https://doi.org/10.1136/tobaccocontrol-2013-051469

Scott, A., Lugg, S. T., Aldridge, K., Lewis, K. E., Bowden, A., Mahida, R. Y., Grudzinska, F. S., Dosanjh, D., Parekh, D., Foronjy, R., Sapey, E., Naidu, B., & Thickett, D. R. (2018). Pro-inflammatory effects of e-cigarette vapour condensate on human alveolar macrophages [10.1136/thoraxjnl-2018-211663]. *Thorax*.

Siegel, D. A., Jatlaoui, T. C., Koumans, E. H., Kiernan, E. A., Layer, M., Cates, J. E., Kimball, A., Weissman, D. N., Petersen, E. E., Reagan-Steiner, S., Godfred-Cato, S., Moulia, D., Moritz, E., Lehnert, J. D., Mitchko, J., London, J., Zaki, S. R., King, B. A., Jones, C. M., Patel, A., Delman, D. M., & Koppaka, R. (2019). *Update: Interim guidance for health*

care providers evaluating and caring for patients with suspected e-cigarette, or vaping, product use associated lung injury — United States. Center for Disease Control and Prevention

U.S. Department of Health and Human Services.

Spradley, J. P. (1979). *The ethnographic interview*. Belmont , CA : Wadsworth/Thomson Learning.

Srivastava, P., & Hopwood, N. (2009). A practical iterative framework for qualitative data analysis. *International Journal of Qualitative Methods*, *8*(1), 76-84. https://doi.org/10.1177/160940690900800107

Tackett, A. P., Lechner, W. V., Meier, E., Grant, D. M., Driskill, L. M., Tahirkheli, N. N., & Wagener, T. L. (2015). Biochemically verified smoking cessation and vaping beliefs among vape store customers. *Addiction*, *110*(5), 868-874.

Talih, S., Balhas, Z., Salman, R., Karaoghlanian, N., & Shihadeh, A. (2016). "Direct dripping": A high-temperature, high-formaldehyde emission electronic cigarette use method. *Nicotine and Tobacco Research*, *18*(4), 453-459. https://doi.org/10.1093/ntr/ntv080

10.1093/ntr/ntv080. Epub 2015 Apr 11.

Tice, D. M., Bratslavsky, E., & Baumeister, R. F. (2001). Emotional distress regulation takes precedence over impulse control: if you feel bad, do it! *Journal of Personality and Social Psychology*, *80*(1), 53-67.

Tobacco products, nicotine vapor products, etc.; purchase, possession, and sale, HB2748 (2019). https://lis.virginia.gov/cgi-bin/legp604.exe?191+sum+HB2748

Trumbo, C. W., & Harper, R. (2013). Use and perception of electronic cigarettes among college students. *Journal of American College Health*, *61*(3), 149-155. https://doi.org/10.1080/07448481.2013.776052

U.S. Department of Health and Human Services. (2012). *Preventing tobacco use among youth and young adults: A report of the surgeon general*. Atlanta, GA: Center For Disease Control and Prevention Office on Somoking and Health

U.S. Department of Health and Human Services. (2016). *E-cigarette use among youth and young adults. A report of the surgeon general.* C. f. D. C. a. P. U.S. Department of Health and Human Services, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. https://www.cdc.gov/tobacco/data_statistics/sgr/e-cigarettes/pdfs/2016_sgr_entire_report_508.pdf

Appendix A

Semi-Structured Interview Questions:

I am interested in learning from you about your thought, beliefs and experiences . . .

1. Can you tell me about yourself?
2. Can you tell me about your life at home?
3. Can you tell me about your school life?
4. How about friends? What are they like?
5. What sort of words or terms to you use to describe e-cigarettes?
6. When did you first hear about vaping? What did you think about it at first?
7. When did you first try e-cigarettes/vaping? What was it like for you?
8. Do any of your friends Vape?
9. Are there words or terms that you use only with other people who vape? Can you tell me about those words?
10. How about family- Do any of them vape?
11. When you vape, how does it make you feel?
12. Do you ever talk about vaping with others? What sort of discussion do you have?
13. Can you tell me about what vaping means to you?
14. Is there anything that you don't like about vaping?
15. What do you like best about vaping?
16. Is there anything you would like to tell me about vaping?

17. What else would you like to know? What else would you like to ask?

Appendix B

Participant demographic form

Instructions: Please provide a response for each of the following questions:

What is your age? _____

What is your gender identification? M ___ F____ Other: please state_____

What is your marital Status?

Single_____ Married_____ Separated_____ Divorced_____ Widowed_____

What is your level of Education?

GED_____ High School Diploma_____ Some College_____ Associates Degree_____

Bachelor's Degree_____ Master's Degree_____ Doctorate _____

Employment

Full-time _____ Part-time _____ Unemployed_____ Student_____

Ethnicity- Select <u>all</u> that apply

White _____ Hispanic _____ Black_____

Native American_____ Asian_____ Alaska Native _____ Native

Hawaiian_____ Pacific Islander_____ Other_____

Religion-_____

Are you a former smoker? _____

Do you currently use tobacco products? _____

What is your personal annual income range?

Under 20,000_____ 20,000 to 40,000_____ 40,000 to 60,000_____ above 60,000 _____

Prefer not to answer_____

What is the estimated annual income of your household?

Under 20,000_____ 20,000 to 40,000_____ 40,000 to 60,000_____ above 60,000_____

Unknown or prefer not to answer _____

Appendix C

DUQUESNE UNIVERSITY

600 FORBES AVENUE ♦ PITTSBURGH, PA 15282

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

TITLE:

Exploring the culture of young adults who use electronic cigarettes

INVESTIGATOR:

Beth Tremblay RN MSN, PhD Student

ADVISOR: (if applicable:)

Dr. Melanie Turk PhD, RN
Associate Professor
Duquesne University
Email mturk@duq.edu
Work Phone 412-369-1817

SOURCE OF SUPPORT:

This study is being performed as partial fulfillment of the requirements for the Doctoral of Philosophy degree in nursing at Duquesne University.

PURPOSE:

You are being asked to participate in a research project that seeks to investigate the experiences of young adults age 18 to 25 who use Electronic Nicotine Devices or e-cigarettes for the purpose of vaping. The Health Care community knows very little about why young adults choose to vape or use other types of e-cigs. Learning about your beliefs, values, and social norms associated with vaping, helps nurses understand what vaping means to you. Learning about how you talk about vaping, the language you use, can help nurses and others in health care understand how we can do a better job of discussing vaping with you.

You are being asked to participate in an interview. This means that we will meet at a place of your choosing that provides enough privacy that you are comfortable talking. You will be asked to answer questions as openly and thoroughly as you feel able. The interview will take between 60 and 90 minutes. A second interview may be requested to help the researcher further clarify beliefs, values, and experiences discussed in initial interviews. The interviews will be recorded and transcribed. Findings may be used in presentations or in research publications. Your identity will remain anonymous and will never be shared. These are the only requests that will be made of you.

RISKS AND BENEFITS:

There are no risks greater than those encountered in everyday life. Potential benefits are that the information obtained from the study will help nurses understand beliefs, values, social norms of young adults who use Electronic Nicotine Devices (e-cigarettes) and the meaning that use has to them.

COMPENSATION:

Participants will receive a $20.00 gift card to Target after your first complete interview. A second interview may be requested to help the researcher further clarify beliefs, values, and experiences discussed in initial interviews. If you agree to a second interview, a second $20.00 Target gift card will be offered. Participation in the project will require no monetary cost to you.

CONFIDENTIALITY:

Your name will never appear on any survey or research instruments. No identity will be made in the data analysis. You will be given a unique identifier. All written materials and consent forms will be stored in a locked file in the researcher's home. All audio data will be stored using encrypted software and stored on a password protected computer. All materials will be destroyed five years after the completion of the research.

RIGHT TO WITHDRAW:

You are under no obligation to participate in this study. You are free to withdraw your consent to participate at any time by contacting the researcher and requesting withdrawal from the study.

SUMMARY OF RESULTS:

A summary of the results of this research will be supplied to you, at no cost, upon request.

VOLUNTARY CONSENT:

I have read the above statements and understand what is being requested of me. I also understand that my participation is voluntary and that I am free to withdraw my consent at any time, for any reason. On these terms, I certify that I am willing to participate in this research project.

I understand that should I have any further questions about my participation in this study, I may call Beth Tremblay RN MSN, PhD Student, Duquesne University, 757-870-5230 or Dr. Melanie Turk at 412-369-1817. Should I have any questions regarding protection of human subject issues, I may contact Dr. David Delmonico, Chair of the Duquesne University Institutional Review Board, at 412.396.1886.

_____ _____

Participant's Signature Date

_____ _____

Researcher's Signature Date

Identifier: ___ ___ ___ ___ ___ ___ ___ ___

3.0 RESULTS MANUSCRIPT

Manuscript #2

EXPLORING AND UNDERSTANDING THE CULTURE OF YOUNG ADULTS WHO VAPE: A FOCUSED ETHNOGRAPHY

Abstract

Introduction: Vaping, the act of inhaling an aerosolized liquid, is associated with health risks. The 18- to 25-year-old age group has the highest rate of vaping among adults. Understanding culturally held values, beliefs, and experiences associated with the behavior of vaping in young adults may uncover the social mechanisms that underpin vaping initiation and influence continued use. The purpose of this study was to explore and understand the cultural values and beliefs about vaping among young adults. **Method:** The method used for this study was a focused ethnography. Young adults who currently vape nicotine (N=24) were recruited via snowball method and self-referral. . Semi-structured interviews were conducted via audio-recording and Zoom online video recording and transcribed into NVivo 12 software. Leininger's four phases of qualitative data analysis guided the concurrent data collection and analysis. Data were collected and analyzed until saturation of data occurred. **Results:** Twenty-four categories and seven patterns were identified; subsequently three themes emerged from the data: 1) Individual and group values influence how vapers engage in community, 2) Vapers identify a scope of health effects, concerns, and nicotine addiction, 3) Vaping is a mechanism for self-calming and coping with internal and external pressures. **Discussion:** This study indicated a culture of vaping among young adults with its own beliefs, values, shared language, and norms. Implications of this study suggest that understanding cultural cues that influence behavior is

critical to culturally competent care at primary and population levels. Culturally congruent interventions at primary, secondary, and tertiary levels are necessary to curb use.

Background

Vaping, or e-cigarette use, is sharply rising in popularity. Young adults, age 18 to 25, have the highest rates of e-cigarette use than any other adult age group, comprising 13.6% of current "vapers" (Gottlieb, 2019; U.S. Department of Health and Human Services, 2016). Vaping is the act of inhaling an aerosolized liquid that contains a solvent (vegetable glycine or propylene glycol) and may contain nicotine and flavoring (United States Food & Drug Administration, 2018). Although most people are aware of e-cigarettes, the dangers are underestimated (Korfei, 2018). A panel of experts ranked e-cigarettes as safer than other combustible tobacco products such as cigars and cigarettes (Nutt et al., 2014). However, since the time of this ranking e-cigarettes have evolved to burn hotter and use alternative forms of nicotine which have increased risks (Eissenberg et al., 2020). The perception of e-cigarettes being safer than combustible traditional cigarettes is reflected in perceptions of young adults (Maglalang et al., 2016; McDonald & Ling, 2015).

The deleterious effects of nicotine on the cardiopulmonary system and the developing brain are well documented. Tests using human airway samples indicated that innate defense proteins associated with Chronic Obstructive Pulmonary Disease were significantly elevated among e-cigarette users (Reidel et al., 2018). Second-hand aerosols from e-cigarettes may also be associated with asthma attacks among youths (Bayly et al., 2019). Nicotine has significant effects on the brains of youth and young adults, including reduced impulse control, mood disorders, addiction, and impaired attention and cognition (U.S. Department of Health and

Human Services, 2012). Nicotine intake from e-cigarettes is comparable to traditional cigarettes among experienced users (Eaton et al., 2018). Nicotine absorption via the lungs when vaping is immediate, as with traditional smoking, and may create the same kind of dependence seen with traditional cigarettes (Schroeder & Hoffman, 2014). The population health consequences of vaping may include an increase in nicotine dependency among young adults who may not have otherwise become "smokers" of traditional cigarettes (Eaton et al., 2018).

Other substances in vapes, like formaldehyde and diacetyl, carry health risks. Formaldehyde releasing agents are formed as propylene glycol, a component of e-liquids, is broken down during the vaping process (Jensen et al., 2015). Formaldehyde is an International Agency for Research on Cancer Class 1A carcinogen. Flavorings used in e-cigarettes are generally safe in foods but not proven as inhalant safe. One flavor component, diacetyl, found in 39 out of 51 e-liquids tested by Allen et al. (2016) can cause the irreversible lung disease bronchiolitis obliterans, or "popcorn lung" (Allen et al., 2016; Farsalinos et al., 2015). Flavored vapes are viewed favorably by young adults (Choi et al., 2012), flavor reinforces vaping behavior (Audrain-McGovern et al., 2016), and 91.6% of young adult e-cigarettes users reported vaping a flavored e-cigarette product (U.S. Department of Health and Human Services, 2012). However, even acute exposure of *unflavored* vaporized e-liquids caused apoptosis and necrosis of alveolar macrophages in vitro (Scott et al., 2018). Thus, any form of e-cigarette use can impact health.

Young Adults

Characteristics of young adults who are more inclined to use e-cigarettes are those who identify young adulthood as a time of experimentation and those who have experienced multiple "role transitions" such as getting or losing a job or a romantic partner (Allem et al., 2015).

Young adults may also experience poor self-regulation, such as impulsivity, which has been correlated to high health-risk behaviors, such as using addictive substances, e.g., nicotine (Schreiber et al., 2012). In a current integrative literature review, Tremblay et al. (2020) found that young adults are ill-equipped to make an informed choice about e-cigarette use due to inaccurate knowledge. Actual e-cigarette users were understudied and tended to value appearance and physical sensation over health; social norms related to e-cigarette use were linked to perception of identity and the current technology-focused culture (Tremblay et al., 2020). The review demonstrated that low numbers of current e-cigarette users were included in the studies; between 3% (Copeland et al., 2017) and 35% (Pokhrel et al., 2018) of participants were currently using e-cigarettes and over represented females (Tremblay et al., 2020). These results indicate a gap in the research exploring the insider's perspective which may reveal meaning and additional cultural influences that contribute to this behavior among young adults.

Role of Culture

Culture includes conscious and tacit beliefs, knowledge, language and behaviors which are internalized, shared, and help determine the lens through which experiences are viewed (Kagawa Singer et al., 2016). Culture also includes how information is transmitted and shared between individuals and groups. Understanding the culture associated with the behavior of vaping in young adults may uncover the social and cultural mechanisms that underpin e-cigarette initiation and continued use. E-cigarette use has expanded how and where nicotine consumption is acceptable, thus changing social practices (Keane et al., 2017). Illumination of the cultural values and beliefs associated with vaping may allow health researchers to develop mediating or moderating interventions that specifically address culture as a health behavior influence (Leininger & McFarland, 2006). Culture is a determinant in population health, but investigators

must explore and define the cultural influences in context and examine the relationship to population health data (Hruschka, 2009). Therefore, the purpose of this qualitative study was three-fold: 1) to understand the values, beliefs, and cultural norms of young adults who vape, 2) to identify how culture is expressed, such as language use around vaping, socialization to vaping, and social benefits related to vaping, are shared and communicated among young adults, and 3) to explore the cultural identity of young adults who vape.

Methods

Design and Sample

This study used a focused ethnography method with a critical realist lens, which allowed the experiences and perspectives of the participants to be viewed via a real-world context. Critical realism emanated from the philosophical writings of Roy Bhaskar from the mid 1970's through the 1990's and integrates both realist ontology and constructivist epistemology (Creswell & Plano Clark, 2011). Ethnography is a qualitative research design which is conducted by the researcher as both participant and observer and focuses on understanding the culture from the emic (insider) perspective (Richards & Morse, 2007). Focused ethnography can be used to study subcultures (Munhall, 2012), which was how the design was used in the current study. In a focused ethnography, the experience of the participants from their perspective is vital (Munhall, 2012). Participant interviews have more importance than the traditional fieldwork of ethnography, and participation by the researcher is not part of a focused ethnographic study, only observation (Richards & Morse, 2007).

Researcher observations added to the study as an 'etic' (outsider) component providing further insight into the emic view (Munhall, 2012). The researcher becomes the instrument in a

focused ethnography (Creswell & Plano Clark, 2011). Observations of participants and spaces such as vape shops and vape lounges were observed and recorded in field notes. Also, photographs of empty social spaces were taken with permission from shop owners or managers. The emic piece of this focused ethnography was fulfilled through semi-structured interviews conducted with participants by the principal investigator (PI). Open-ended questions enabled participants to share their beliefs, values, experiences, and shared cultural characteristics related to using e-cigarette products and how beliefs, values, and experiences about e-cigarette use were shared and communicated to others. Study permission was granted by Duquesne University IRB.

Participant selection and size

Young adults aged 18 to 25 years old who currently and regularly vape nicotine were eligible to participate in the study. Participants (N = 24) were recruited for this study through snowball sampling (Polit & Beck, 2008), word of mouth and self-referral. *Current use* was defined as having used an e-cigarette in the past 30 days. *Regular use* was defined as using an e-cigarette at least three times per week for six months. To be included in the study, participants could self-identify as "vapers" by a positive response to "do you consider yourself to be a vaper?" or meeting the definition of regular users of nicotine e-cigarettes. Recruitment flyers were posted in physical spaces where young adults frequent and via social media platforms. Interested persons were asked to contact the PI via text, email, or phone call. After being contacted, the PI screened the individual for inclusion criteria. If a participant met the inclusion criteria, an interview was scheduled either at a location of the participant's choosing, or through a protected account on the virtual platform, Zoom. The first 10 interviews took place face-to-face. Interviews were conducted between January and October 2020. Due to the state governor's

stay-home orders in March of 2020 due to the COVID-19 pandemic, the remaining interviews (n=14) were conducted via Zoom®.

Measures

A semi-structured interview guide of open-ended questions was used to enable participants to share their beliefs, values, and experiences about using e-cigarettes. Questions were aimed at elucidating participant's experiences, shared language, family and social networks, and beliefs about vaping. As new data emerged from the interviews, additional questions were added to investigate new concepts, such as experiences with health care professionals. Face-to-face interviews were recorded with an audio recorder. Zoom® meetings were audio and video recorded. Demographic data were collected to describe the characteristics of the participants. Informed consent and demographic forms were collected on paper during face-to-face interviews and using Qualtrics® if the interview was completed remotely via Zoom®. The Qualtrics link® was sent via email or text message to participants. The PI confirmed completion of the consent form prior to starting the interview. A copy of the consent form was provided in paper form or as a PDF document. Electronic documents were sent either via text or email based on the participant's preference. Participants received a $20 Target® gift card at the end of the interview for their participation in the study.

Analytic strategies

Leininger's four phases of qualitative data analysis guided the data analysis (Leininger & McFarland, 2006; McFarland, 2012). Data were collected and analyzed concurrently. In the first phase, raw data was collected and documented through audio and video recording of semi-

structured interviews, field notes of the researcher's observations, and photographs of vape shops and lounges over ten months. In the second phase, 24 interview recordings were transcribed into Word documents, then entered into a qualitative data analysis software, NVivo 12 (QSR International, 2021). A confidential transcription service was used for the face-to-face interviews, and the Zoom® auto-translate function was used for the remote interviews. During the second phase, emic and etic data were categorized in alignment with the guiding research questions with the ability for openness to the discovery of new data. Photographs of vape shop spaces added to the environmental data. In the third phase, the researcher identified patterns, beliefs and practices based on the interview data and field notes to add to the contextual data. No second interviews were deemed necessary as data saturation and elucidation of themes occurred across multiple interviews. In the fourth phase, the researcher identified major themes. A descriptive interpretation of the complex culture as experienced by vapers, or "thick description", of the themes within the social context was developed through reflection on interviews, field notes, and visual data. Further reflection on notes enhanced study rigor (Munhall, 2012; Richards & Morse, 2007). Future research recommendations, study strengths and limitations were identified in the final stage of analysis (Leininger & McFarland, 2006).

Results

The average age of the participants was 20.4 (SD = 1.74) years old (range = 18-24). Additional demographic information is provided in Table 1. Twenty four categories were identified in the first phase of analysis. Through further coding and analysis, seven patterns were identified. Finally, patterns, interpretations of written and photographic field notes, and annotations of interviews were analyzed for thematic evidence. Three themes resulted from this process. See Table 2 for the full list of categories, patterns, and themes.

Theme 1: Individual and group values influence how vapers engage in their community.

Theme one revealed cultural elements including shared language, shared activities, a sense of community, and a perception that people outside of that community stigmatized vaping. The first theme is supported by expressions of the individual values, socialization to vaping, and feeling connected through the vaping community. Participants described e-cigarette use as "a lifestyle". They valued vape flavors, especially fruit flavors, and that vaping didn't make them "smell," give them "bad breath," or stained teeth. Shared terminology included common words for vaping products, e.g., "vapes," "mods," "Juul," or "mods", and the activities related to vaping. Some participants developed their own slang terms for their devices such as "thick-um" or "toolie." Overwhelmingly, participants valued the "buzz" or "head rush" from nicotine while vaping. The most common term for vaping activity was "hit," which means to inhale the aerosol from the e-cigarette. Participants also reported asking, "Can I hit that?" when sharing e-cigarettes with friends or acquaintances. The socialization aspects were vaping as a bonding activity with family and friends or as a gateway to of new friendships. Some participants identified that "friends got me into it" and "I wanted to fit in." One participant said,

> My brother told me about it. He was the one who kind of introduced me to the to the actual (vape) pen. He got me my first one, which was cool. And we kind of do that as a bonding activity.

Social inclusion associated with vaping revealed two sub-groups of vapers among the participants. One group preferred either a pod-based or disposable device which are discreet and create very little vapor. The other group preferred a refillable device which create large plumes of vapor called "clouds" or "fat clouds". Participants who preferred refillable devices were more likely to engage in customizing e-cigarettes as a hobby. Vape shops we visited had work benches and tools for customers work on their devices and spaces to play games. For

example, one vape shop had one-foot markers painted on a wall. Competitors stand at one end and blow out vapor to see whose "cloud" goes the furthest. Other shops had video games and pool tables that encourage in-shop socialization.

The benefits of the vaping community may be counterbalanced by the larger community. Despite the reported positive aspects of vaping, participants also reported not liking the expense and felt stigmatized or shamed in some situations. This feeling of stigma often extended to conversations with health care providers (HCP) and prevented them from disclosing e-cigarette use even when asked directly. One participant explains, "Really, just because I don't want to be guilt tripped. Because I already know that it's bad." Another participant noted that they were comfortable discussing sex and alcohol with their HCP but not vaping because, "(vaping) is just not as accepted". Another stated,

> I would be too embarrassed to talk to (my doctor) about it. He has known me since I was little, and I can't go to him and say that I am vaping and want to stop and ask for a patch. I would be way too embarrassed.

Theme 2: Vapers identify a scope of health effects, concerns, and nicotine addiction.

Theme two established a range of beliefs about the risks of vaping and concerns about and experiences of adverse health symptoms. Most reported "coughing" and "burning" in their chests when they first tried e-cigarettes, a feeling that improved when they "learned how to do it." Participants who were prior traditional cigarette smokers stated their health improved. Some participants felt that e-cigarettes were a healthier choice than traditional cigarettes because, as one participant put it, "And this is literally like nicotine and like a glycerin substance. It's not tar." Another stated, "It's not like they're gonna make my teeth fall out (of) my head like cigarettes." Other participants reported adverse health experiences, such as chest pain and tightness, increase in phlegm production, and decreased exercise tolerance. Several participants

withheld information during primary care visits and hospitalizations they believed were linked to e-cigarette use. One participant said,

> I got bronchitis about a month ago and they said, 'it looks like you have bronchitis.' But then I was like, well, is it really bronchitis or is it because I'm vaping? And I wanted to ask but honestly, I was scared to ask—scared of the answer. So, I just let it go.

Most participants stated that they did not know the long-term health effects or risk of nicotine addiction of e-cigarettes and wanted to see more research on the topic.

The second theme also encompasses a scope of awareness ranging from the denial of addiction to the realization of nicotine dependence. When asked about what vaping meant, one participant responded, "It's something I do, and I can't get out of it." Another described e-cigarettes as "addicting" while others said they could "probably stop anytime and not look back" even when they reported withdrawal symptoms, like headache and irritability, when they do not vape. Participants who recognized their addiction reported that this awareness emerged suddenly and stated they had trouble finding ways to quit. One participant stated,

> The addiction. And I can't get nicotine patches to help me quit. Like I went to the CVS and asked to buy a nicotine patch, since I can buy vapes, and they won't sell me one because you have to be 21.

Theme 3: Vaping is a mechanism for self-calming and coping with internal and external pressures.

Theme three revealed complex motivations for vaping initiation and continued use beyond the social aspects identified in the first theme. Participants reported vaping as a way to cope with societal pressures. Analysis of the data exposed two further subgroups of this theme; those who used vaping to cope with day-to-day stressors, e.g., "balancing work and school," and those who disclosed using vaping to manage chronic underlying mental health conditions, such as anxiety, panic disorder, depression, and attention deficit hyperactivity disorder (ADHD).

The second group of participants were more likely to reveal past trauma like sexual assault, growing up with parents with severe mental health disorders, or experiencing transient housing before age 18. Participants reported vaping helped them calm down so they could participate in social situations or function better at work and school. One participant stated, "I'm having a really bad day, really down, like I'm just, I'm Chiefin' it." Another participant who had previous severe motor vehicle accidents and had lost family and friends to car accidents used e-cigarettes as a distraction from anxiety producing activities like driving. One participant stated,

> I think that nine out of 10 people who have started smoking or vaping at some point probably come from either four or like really stressful circumstances in their childhoods. It's like a lot of my well rounded healthy friends don't (vape) at all.

Several participants discussed that the "hand-to-mouth" activity of e-cigarettes helped them cease other anxious behaviors such as nail biting and picking at their lips. Participants who were college students stated that vaping helped them "focus" on their studies. Underlying mental health conditions influenced initiation of vaping for some participants. One participant shared, "I suffer from anxiety and depression and that's kind of how I picked up vaping. It was, like, a coping mechanism." Another participant shared a reason for vaping initiation,

> I've done breathing exercises before, but I think the flavored aspect made it easier… because you're getting, like, a reward out of it… you get whatever flavor you buy. And so, it made it kind of easier. And it's kind of in a way more socially acceptable than you, sitting there, like, doing breathing exercises in public. I felt.

Discussion

The thematic findings of this study were congruent with the goals and aims of the study. A pictorial and abstracted model for understanding young adult vaping culture in context with

societal culture emerged (see figure 3). The model demonstrates the inter-relationship between themes within a culture of vaping but also represents how the general societal culture influences the unique cultural elements of vaping. For example, outside influences like participant's perception of stigma from health care providers (Theme 1), became a barrier to seeking help for nicotine addiction (Theme 2). This example also creates a barrier to screening for underlying mental health conditions (Theme 3) managed by vaping behavior since young adults may withhold information on their vaping status.

Theme 1: Individual and group values influence how vapers engage in their community.

Theme one elucidated how vaping among young adults encompasses key elements of a culture. These elements were shared language and activities, a sense of community connection through vaping, a perception of being 'stigmatized' by those outside of the vaping community, and shared values. Shared language is essential to explore when investigating culture. Language not only describes, but constructs our perceptions of the world around us (Thomas & McDonagh, 2013). In this study, participants used language around the products and the act of vaping. The phrase, "Can I hit that" was commonly shared in this study and consistent with current research among college age vapers (Katz et al., 2020). Participants commonly referred to their own vaping devices by their brand names. Products and consumption of specific goods fulfilled a personal preference but may also have filled a role in showing personal identity to others through symbols (Douglas & Isherwood, 2021). Identifying with consumable goods was seen in this study through participant choice of brand and style of device. For example, some chose a low-vapor producing decreet device versus a device that would attract attention due to the amount of exhaled vapor.

Participants also discussed vaping as a way to bond with others. Several participants reported that they either started to vape because they wanted to make new friends, and others started vaping with friends as a group. Participants also reported being influenced by peers to continue to vape. These behavioral influences are consistent with social learning theory (Bandura, 1977). Transmission of information via social contacts noted in another current study was confirmed in our study (Keane et al., 2017). The influences of peers and family on vaping behavior appreciated in our study mirror prior traditional cigarette smoking behavior research among young adults (Ellickson et al., 2003). Consistent with past research, participants valued the taste and that e-cigarettes didn't stain their teeth or make their breath smell bad (Keane et al., 2017; Lee et al., 2017). Despite social benefits, some participants noted that they felt there was a stigma attached to vaping and that people outside of the vaping community, including health care providers, disapproved of vaping. Fear of stigma is associated with hiding and under reporting health behaviors rather than behavioral change (Bharadwaj et al., 2017). Perceived stigma from health care professionals is particularly worrisome because vaping carries health risks, and stigma is a barrier to either seeking care or providing full disclosure of their health behaviors. This study adds to the literature a greater reticence among young adults to disclosing vaping behavior than disclosing other health behaviors like alcohol use.

Theme 2: Vapers identify a scope of health effects, concerns, and nicotine addiction.

Theme two revealed that participants had a range of physical health symptoms related to vaping, were concerned about unknown future health consequences, and experienced a scope of nicotine dependence, from no to severe dependence. Prior traditional cigarette smokers in this study reported improved perception of health based on feeling less out of breath with activity than when smoking, which is consistent with past studies (Gucht et al., 2017). Participants who

were new to vaping, however, reported more difficulty breathing during activity, increased phlegm in their lungs, and chest pain. Reports of chest pains and phlegm are consistent with another recent study where participants also attributed these symptoms to e-cigarette use (Kechter et al., 2020). The current study also adds qualitative reports of young adults' experience of chest pain, new illness, which they attribute to nicotine e-cigarettes, and exacerbations of underlying cardiac and pulmonary disease. The belief among our participants that e-cigarettes are healthier than traditional cigarettes is consistent with past research (Martinasek et al., 2018; Trumbo & Harper, 2016). Participants' belief that e-cigarettes are not harmful to teeth and gums is countered by research that indicates e-liquids caused the release of inflammatory cytokines associated with periodontal disease in the same way as traditional cigarettes (Karaaslan et al., 2020). Due to their viscous nature, e-liquids may stay on oral mucosa and contribute to disease (Irusa et al., 2020). Participants also reported concern about long term health effects of e-cigarettes use; several were glad to see research about e-cigarettes because they could not find information on their own about long-term effects.

Participants' awareness about their own level of nicotine dependence spanned from believing that they had zero dependence and could stop any time to accepting that they were addicted to nicotine. Some participants who reported withdrawal symptoms did not make the connection to addiction. Others, who were aware of their addiction to nicotine, reported that the awareness was sudden. The sudden emergence of awareness is consistent with another recent study of young adult vapers (Katz et al., 2020). Thus, young adults may need counseling to become aware of their own addiction. Although the minimum age to purchase e-cigarettes, 21 in Virginia, is the same as buying nicotine cessation products, participants reported that purchasing e-cigarettes was easy and that they could not purchase nicotine cessation products due to age

restrictions. This may be a reflection of a societal view that e-cigarettes are not harmful or a lack of sales regulation.

Theme 3: Vaping is a mechanism for self-calming and coping with internal and external pressures.

Theme three revealed a somewhat unexpected loci of the influences of life stressors on vaping behavior that warrant further study. The participants in this study described vaping as a way of coping with both day-to-day stressors as well as long term stressors caused by past emotional trauma and mental health conditions. Similarly, a recent study found that adolescents who vaped experienced higher levels of stress than their non-vaping counter parts (Jha & Kraguljac, 2021). Also, traditional cigarette use has been linked to new-onset mood disorders among young adults (Mojtabai & Crum, 2013). Our study also found that many participants were uncomfortable talking to their Health Care Providers (HCP) about vaping in theme one, exposing a critical barrier to providing holistic mental health care. Participants said that they preferred a non-judgmental and informative approach where help was offered.

The more accurate a young adult's information about vaping, the less likely they are to start. A retrospective cross-sectional study indicated an inverse relationship between regular e-cigarette use and both knowledge and self-efficacy (Jones et al., 2021). However, (Maglalang et al., 2016) reported a link between seeking information about vaping and subsequent initiation of vaping. Yet, young adults' main source of information was television and advertising (Trumbo & Kim, 2015) or from friends (Maglalang et al., 2016). Our study confirms that participants learned from friends but also online forums. A combination of inaccurate information sources, using vaping as a coping mechanism, and lack of disclosure to health care professionals about their vaping, puts young adults at risk for physical and mental health concerns. The results of

theme three are vital to health care professionals in improving care of young adult patients. The presence of vaping among young adults may reveal ineffective coping or an untreated mental health condition. If providers take a nonjudgmental, culturally competent approach, young adults may be more transparent with health behaviors such as vaping.

Strengths and Weaknesses

The strengths of the study included using online interviews for the last 14 interviews which eliminated geographic or travel concerns. All participants were currently and regularly vaping which allowed a previously unresearched insider's view. This study had more males, who are more likely to vape, than females unlike past studies where males were under represented (Tremblay et al., 2020). Weaknesses of the study were that using online interviews limited some visual cues during interviews when a participant declined to turn on the video. Also, online interviews may have limited recruitment if people did not have access to a smart phone or computer with internet; however, young adults are likely to prioritize having access to technology. Most participants had completed at least some college, thus young adults who did not seek higher education were underrepresented in this study.

Practice and research implications

Implications of this study suggested primary, secondary, and tertiary prevention strategies. Primary care prevention would include education for all youth and young adults. Secondary prevention includes routine screening for e-cigarette use and related health effects using a non-judgmental approach. Screening for use should also include screening for mental wellness and referral to counseling services. Tertiary interventions may include referral to nicotine cessation programs and prescriptions for cessation products. Public health implications are to offer widespread health teaching that highlight known dangers associated with vaping.

Public health policy implications of the study are to review regulation and enforcement of age limitations for e-cigarettes to limit access. Integrating cultural knowledge about vaping in the care of young adults will improve culturally congruent care.

The cultural elements, motivation for initial and continued use, and association with mental health conditions should inform future research. Future research should focus on developing and testing interventions for vaping prevention and cessation. Additional research is needed on how vaping is used for coping with mental health conditions in this age group and investigate a potential association between vaping and mood disorders. Future research should also focus on health care providers to assess knowledge and reduce stigma, which may create barriers to care of young adults.

Conclusion

This study indicated a culture of vaping among young adults with its own beliefs, values, shared language, and norms. Understanding cultural cues that influence behavior is critical to culturally competent care at primary and population levels. This vaping culture was influenced by the predominant societal culture in terms of ease of buying vape products and stigma from health care practitioners. This study adds to the body of research that demonstrates that young adults are ill informed about the risks of vaping and will continue to vape despite experiencing health effects.

4.0 FUNDING

EXPLORING AND UNDERSTANDING THE CULTURE OF YOUNG ADULTS WHO VAPE: A FOCUSED ETHNOGRAPHY

Funding

Financial support was received Sigma Theta Tau (Epsilon Chapter) of Duquesne University and the Duquesne University Gumberg Library.

References

Allen, J. G., Flanigan, S. S., LeBlanc, M., Vallarino, J., MacNaughton, P., Stewart, J. H., & Christiani, D. C. (2016). Flavoring chemicals in e-cigarettes: Diacetyl, 2,3-pentanedione, and acetoin in a sample of 51 products, including fruit-, candy-, and cocktail-flavored e-cigarettes. *Environmental Health Perspectives*, *124*(6), 733-738. https://doi.org/10.1289/ehp.1510185

Audrain-McGovern, J., Strasser, A. A., & Wileyto, E. P. (2016). The impact of flavoring on the rewarding and reinforcing value of e-cigarettes with nicotine among young adult smokers. *Drug and Alcohol Dependence*, *166*, 263-267. https://doi.org/https://doi.org/10.1016/j.drugalcdep.2016.06.030

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191-215. https://doi.org/10.1037/0033-295X.84.2.191

Bayly, J. E., Bernat, D., Porter, L., & Choi, K. (2019). Secondhand exposure to aerosols from electronic nicotine delivery systems and asthma exacerbations among youth with asthma. *Chest*, *155*(1), 88-93.

Bharadwaj, P., Pai, M. M., & Suziedelyte, A. (2017). Mental health stigma. *Economics Letters*, *159*, 57-60.

Choi, K., Fabian, L., Mottey, N., Corbett, A., & Forster, J. (2012). Young adults' favorable perceptions of snus, dissolvable tobacco products, and electronic cigarettes: findings from a focus group study. *American Journal of Public Health*, *102*(11), 2088-2093. https://doi.org/10.2105/ajph.2011.300525

Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd edition ed.). Sage.

Douglas, M., & Isherwood, B. (2021). *The world of goods*. Routledge.

Eaton, D. L., Kwan, L. Y., & Stratton, K. (2018). *Public health consequences of e-cigarettes*. http://search.ebscohost.com/login.aspx?direct=true&db=cmedm&AN=29894118&site=ehost-livehttps://www.nap.edu/catalog/24952/public-health-consequences-of-e-cigarettes

Eissenberg, T., Bhatnagar, A., Chapman, S., Jordt, S.-E., Shihadeh, A., & Soule, E. K. (2020). Invalidity of an oft-cited estimate of the relative harms of electronic cigarettes. *American Journal of Public Health*, *110*(2), 161-162. https://doi.org/10.2105/AJPH.2019.305424

Ellickson, P. L., Perlman, M., & Klein, D. J. (2003). Explaining racial/ethnic differences in smoking during the transition to adulthood. *Addictive Behaviors*, *28*(5), 915-931.

Farsalinos, K. E., Kistler, K. A., Gillman, G., & Voudris, V. (2015). Evaluation of electronic cigarette liquids and aerosol for the presence of selected inhalation toxins. *Nicotine and Tobacco Research*, *17*(2), 168-174. https://doi.org/10.1093/ntr/ntu176

10.1093/ntr/ntu176. Epub 2014 Sep 1.

Gottlieb, S. (2019). *Modifications to compliance policy for certain deemed tobacco products: Guidance for industry*. U.S. Department of Health and Human Services, Food and Drug Admnistration, Center for Tobacco Products Retrieved from Office of Compliance and Enforcement, Office of Health Communication and Educations, Office of Reculations, and Offic of Science in the Center for Tobacco Products at the FDA.

Gucht, D. V., Adriaens, K., & Baeyens, F. (2017). Online vape shop customers who use e-cigarettes report abstinence from smoking and improved quality of life, but a substantial

minority still have vaping-related health concerns. *International journal of environmental research and public health*, *14*(7), 798.

Hruschka, D. J. (2009). Culture as an explanation in population health. *Annals of Human Biology*, *36*(3), 235-247.

Irusa, K. F., Vence, B., & Donovan, T. (2020). Potential oral health effects of e-cigarettes and vaping: A review and case reports. *Journal of Esthetic & Restorative Dentistry*, *32*(3), 260-264. https://doi.org/10.1111/jerd.12583

Jensen, R. P., Luo, W., Pankow, J. F., Strongin, R. M., & Peyton, D. H. (2015). Hidden formaldehyde in e-cigarette aerosols. *New England Journal of Medicine*, *372*(4), 392-394.

Jha, V., & Kraguljac, A. (2021). Assessing the Social Influences, Self-Esteem, and Stress of High School Students Who Vape. *The Yale journal of biology and medicine*, *94*(1), 95-106.

Jones, R. D., Asare, M., & Lanning, B. (2021). A retrospective cross-sectional study on the prevalence of e-cigarette use among college students. *Journal of Community Health*, *46*(1), 195-202.

Kagawa Singer, M., Dressler, W., George, S., Baquet, C. R., Bell, R. A., Burhansstipanov, L., Burke, N. J., Dibble, S., Elwood, W., Garro, L., Gravlee, C. C., Guarnaccia, P., Hecht, M. L., Henderson, J., Hruschka, D., Lewis-Fernández, R., Like, R., Mouton, C., Myers, H. F., Page, J. B., Pasick, R., Pescosolido, B., Schoenberg, N., Stoner, B., Strayhorn, G., Szalacha, L., Trimble, J., Weisner, T. S., & Williams, D. (2016). Culture: The missing link in health research. *Social Science & Medicine*, *170*, 237-246. https://doi.org/https://doi.org/10.1016/j.socscimed.2016.07.015

Karaaslan, F., Dikilitaş, A., & Yiğit, U. (2020). The effects of vaping electronic cigarettes on periodontitis. *Australian dental journal*, *65*(2), 143-149.

Katz, S. J., Cohen, E. L., & Kinzer, H. T. (2020). "Can I hit that?" Vaping knowledge, attitudes and practices of college students. *Journal of American College Health*, 1-10.

Keane, H., Weier, M., Fraser, D., & Gartner, C. (2017). 'Anytime, anywhere': vaping as social practice. *Critical Public Health*, *27*(4), 465-476. https://doi.org/10.1080/09581596.2016.1250867

Kechter, A., Schiff, S. J., Simpson, K. A., Ceasar, R. C., Braymiller, J. L., McConnell, R., Leventhal, A. M., & Barrington-Trimis, J. L. (2020). Young adult perspectives on their respiratory health symptoms since vaping. *Substance Abuse*, 1-13.

Korfei, M. (2018). The underestimated danger of E-cigarettes - also in the absence of nicotine. *Respiratory Research*, *19*(1), 159. https://doi.org/10.1186/s12931-018-0870-4

Lee, H. Y., Lin, H. C., Seo, D. C., & Lohrmann, D. K. (2017). Determinants associated with e-cigarette adoption and use intention among college students [Article]. *Addictive Behaviors*, *65*, 102-110. https://doi.org/10.1016/j.addbeh.2016.10.023

Leininger, M. M., & McFarland, M. R. (2006). *Culture care diversity and universality a worldwide nursing theory* (2nd ed.. ed.). Sudbury, MA : Jones and Bartlett.

Maglalang, D. D., Brown-Johnson, C., & Prochaska, J. J. (2016). Associations with e-cigarette use among Asian American and Pacific Islander young adults in California. *Preventive Medicine Reports*, *4*, 29-32. https://doi.org/10.1016/j.pmedr.2016.05.011

Martinasek, M. P., Bowersock, A., & Wheldon, C. W. (2018). Patterns, perception and behavior of electronic nicotine delivery systems use and multiple product use among young adults. *Respiratory Care*, *63*(7), 913-919. https://doi.org/10.4187/respcare.06001

McDonald, E. A., & Ling, P. M. (2015). One of several 'toys' for smoking: young adult experiences with electronic cigarettes in New York City. *Tobacco Control*, *24*(6), 588-593. https://doi.org/10.1136/tobaccocontrol-2014-051743

McFarland, M. M., Sandra & Wehbe-Alamah, Hiba & Burk, Renee. (2012). Ethnonursing: A qualitative research method for atudying culturally competent care across disciplines. *International Journal of Qualitative Methods*, *11*. https://doi.org/10.1177/160940691201100306.

Mojtabai, R., & Crum, R. M. (2013). Cigarette smoking and onset of mood and anxiety disorders. *American Journal of Public Health*, *103*(9), 1656-1665.

Munhall, P. L. (2012). *Nursing research: A qualitative perspective* (5th edition ed.). Jones & Bartlett Learning.

Nutt, D. J., Phillips, L. D., Balfour, D., Curran, H. V., Dockrell, M., Foulds, J., Fagerstrom, K., Letlape, K., Milton, A., Polosa, R., Ramsey, J., & Sweanor, D. (2014). Estimating the harms of nicotine-containing products using the MCDA approach. *European Addiction Research*, *20*(5), 218-225. https://doi.org/10.1159/000360220

Polit, D. F., & Beck, C. T. (2008). *Nursing research: Generating and assessing evidence for nursing P\practice* (8th ed.). Lippincott Williams & Wilkins.

Reidel, B., Radicioni, G., Clapp, P. W., Ford, A. A., Abdelwahab, S., Rebuli, M. E., Haridass, P., Alexis, N. E., Jaspers, I., & Kesimer, M. (2018). E-cigarette use causes a unique innate immune response in the lung, involving increased neutrophilic activation and altered mucin secretion. *American Journal of Respiratory and Critical Care Medicine*, *197*(4), 492-501. https://doi.org/10.1164/rccm.201708-1590OC

Richards, L., & Morse, J. M. (2007). *Read me first: User's guide to qualitative methods* (2nd ed.). Sage Publications Ltd.

Schreiber, L. R. N., Grant, J. E., & Odlaug, B. L. (2012). Emotion regulation and impulsivity in young adults. *Journal of psychiatric research*, *46*(5), 651-658. https://doi.org/10.1016/j.jpsychires.2012.02.005

Schroeder, M. J., & Hoffman, A. C. (2014). Electronic cigarettes and nicotine clinical pharmacology. *Tobacco Control*, *23*(S2), ii30-35. https://doi.org/10.1136/tobaccocontrol-2013-051469

Thomas, J., & McDonagh, D. (2013). Shared language:Towards more effective communication. *The Australasian medical journal*, *6*(1), 46-54. https://doi.org/10.4066/AMJ.2013.1596

Tremblay, B., Turk, M. T., Cooper, M. R., & Zoucha, R. (2020). Knowledge, attitudes, and perceptions of young adults about alectronic nicotine delivery systems in the United States: An integrative review. *The Journal of Cardiovascular Nursing*. doi: 10.1097/JCN.0000000000000731. Online ahead of print.

Trumbo, C. W., & Harper, R. (2016). A comparison of students and non-students with respect to orientation toward e-cigarettes. *Journal of Public Health Research*, *5*(2), 595. https://doi.org/10.4081/jphr.2016.595

Trumbo, C. W., & Kim, S.-J. S. (2015). The effect of electronic cigarette advertising on intended use among college students. *Addictive Behaviors*, *46*, 77-81. https://doi.org/10.1016/j.addbeh.2015.03.005

U.S. Department of Health and Human Services. (2012). *Preventing tobacco use among youth and young adults: A report of the surgeon general*. Department of Health and Human Services, Office on Smoking and Health.

U.S. Department of Health and Human Services. (2016). *E-cigarette use among youth and young adults. A report of the surgeon general.* Department of Health and Human Services, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. https://www.cdc.gov/tobacco/data_statistics/sgr/e-cigarettes/pdfs/2016_sgr_entire_report_508.pdf

United States Food & Drug Administration. (2018). *Vaporizers, e-cigarettes, and other electronic nicotine delivery systems (ENDS)*. Retrieved January 2 from https://www.fda.gov/TobaccoProducts/Labeling/ProductsIngredientsComponents/ucm456610.htm

Table 1

Demographic characteristics of the sample (N=24)

Characteristics	(n) %
Gender	
Male	(14) 58.3%
Female	(10) 41.7%
Race/Ethnicity	
Non-Hispanic Caucasian	(16) 67%
Non-Hispanic Black	(4) 17%
Hispanic	(2) 8%
Other	(1) 4%
Preferred not to answer	(1) 4%
Highest level of education	
High School Diploma or GED[a]	(2) 8%
Some College/ Associate degree	(18) 75%
Bachelor's Degree	(3) 13%
Master's Degree	(1) 4%
Employment status	
Student only	(6) 25%
Part-time work	(13) 54%
Full time	(5) 21%
Married	(2) 8%
Personal Income	(13) 54%
Less than 20,000	(7) 29%
20,000 to 40,000	(0) 0%
40,000 to 60,000	(1) 4%
Greater than 60,000	(3) 13%
Preferred not to answer	
Household Income	
20,000 to 40,000	(5) 21%
40,000 to 60,000	(3) 13%
Greater than 60,000	(11) 46%
Preferred not to answer	(5) 21%
Former cigarette smoker	(6) 25%

[a] General Educational Development

Table 2

Categories, Patterns, and Themes

Categories	Patterns	Themes
Adverse health symptoms	Pattern of adverse physical symptoms related to vaping	Individual and group values influence how vapers engage in their community.
Assessment and counseling from health care providers	Pattern of nicotine addiction from vaping	Vapers identify a scope of health effects, concerns, and nicotine addiction.
Cessation products	Pattern of feeling stigmatized and shamed by health care providers about vaping	Vaping is a mechanism for self-calming and coping with internal and external pressures.
Cues to vape	Pattern of belief about relative health risks related to smoking	
Customized vapes		
Expense of vaping	Pattern of finding pleasure while vaping	

Friends	Pattern of connecting to vapers and others through vaping	
Healthier than cigarettes	Pattern of day to day and psychosocial life stressors	
Hiding vaping		
I can quit any time		
Long term stressors		
Not good for me		
Relaxing		
Sensory experience		
Shared language		
Sharing vapes		
Short term stressors		
Social bond		
Stigma		

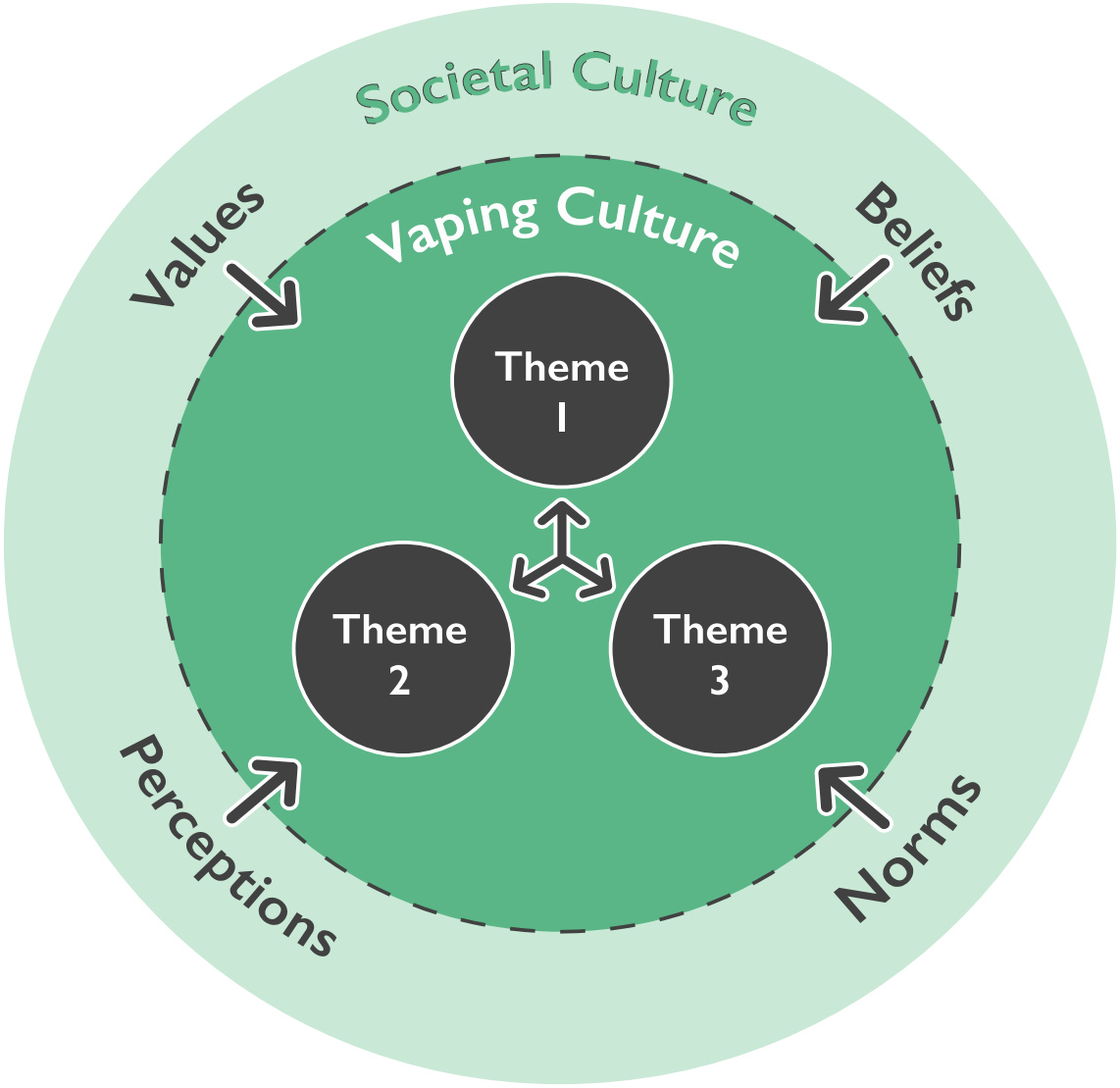
Categories	Patterns	Themes
Vaping is better for appearance		
Vaping is cool		
Weaning off vapes		

What is important to me

Withdrawal

Figure 1

Abstracted and Pictorial model of vaping culture



Note: Theme 1: Individual and group values influence how vapers engage in their community.
Theme 2: Vapers identify a scope of health effects, concerns, and nicotine addiction.
Theme 3: Vaping is a mechanism for self-calming and coping with internal and external pressures.