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Factors Associated with Menthol Cigarettes Smoking Among Youths Ages 12 to 19

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2018

Abstract

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MS, A.T Still University of Health Science, 2015

BSc, University of Maryland University College, 2012

BSc, Kennedy Western University, 2003

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Abstract

Menthol is added to cigarettes to make smoking more convenient. Menthol is considered a contributing factor that makes smoking appealing to youths and their continuous smoking initiation, which progresses to regular cigarette smoking and addiction, especially among youths ages 12 to 19. Menthol encourages approximately 4,000 youths to experiment with smoking daily in the United States, of which approximately 1,000 become active smokers. Not enough is known regarding the influence of menthol on youth smoking initiation/smoking behavior. A quantitative analysis of data from the 2014 National Youth Tobacco Survey (NYTS) was used to explore the association between age, race/ethnicity, gender, grade (education level), and menthol cigarette smoking among youth ages 12 to 19. The sample size for this study consisted of 115 adolescents aged 12 to 19 years, in the United States taken from the 2014 NYTS data. The theoretical framework for this study was the theory of planned behavior (TPB). The independent variables were ethnicity/race, gender, age, and grades (education level), while the dependent variable is the type of smoking: menthol versus nonmenthol. Bivariate analysis revealed that there was a statistically significant relationship between age ($p = <.001$), race/ethnicity ($p = <.001$), gender ($p = <.001$), grade (education level) ($p = <.001$), and menthol cigarette smoking; however, no statistically significant results were obtained in the multivariate regression analysis. Future research is needed to better determine and understand the factors associated with youth smoking initiation and behavior. The potential positive social change impact of this study is a better understanding of youth smoking behavior and the development of more effective prevention interventions to protect the health of this vulnerable population.

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Dedication

This dissertation is dedicated to my lovely wife, Michel Paul Eguae; my two sons; Osazee D. Eguae, and Efosa J. Eguae. Your love, prayers, and support were the motivations that sustained me throughout this study.

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Introduction

Menthol is a gateway to cigarette smoking (Hoffman, 2011). It is considered a contributing factor to smoking behavior, especially for first time smokers and it may reinforce the interest to smoke in long time smokers (Hoffman, 2011). Most of the health-related issues associated with smoking include respiratory disease which is caused by excessive use and exposure to cigarettes and cigarette smoke and their content. One of these content elements is menthol (Hoffman, 2011); in addition, there is a high morbidity and mortality rate among youths and their continuous use of tobacco products including mentholated cigarettes (Hoffman, 2011). Recent studies show that there is a systematic increase in the sale and use of menthol despite various government regulation to reduce youth access to cigarette and other tobacco product (Richardson, Ganz, Pearson, Celcis, Vallone, & Villanti, 2015).

The history of menthol can be traced back to the early 1920s when it was accidentally discovered by Lloyd Hughes (Ogden, 2010) and was later patented in 1925 (Sutton & Robinson, 2003). However, in 1956, Salem launched the first filtered menthol cigarettes, which grew in popularity steadily between 1960 and 1970, accounting for 27% of United States cigarette sales (Ogden, 2010). Menthol (natural) 99.5% pure, or (synthetic), chemically produced, caught the attention of tobacco companies, and menthol was aggressively advertised and marketed (Ogden, 2010). During that same period (between 1960 and 1970), the public interest for menthol began to grow, and with

continuous advertising, smoking behavior increased, especially among youths (Ogden, 2010). Youths are among the major consumers of mentholated cigarettes, and menthol is commonly used during the experimental period of smoking, which usually progresses to regular smoking behavior and initiation (Ahijevych & Garrett, 2004; Giovino et al., 2004; Hoffman, 2011; Muilenburg & Legge, 2008).

Proponents have argued that the addition of menthol to a cigarette decreases the harshness associated with smoking, and enhances the taste (Perfetti, 1993; Ahijevych et al., 2004). Ahijevych et al., (2004) discussed how the cooling substance in menthol serves as a local anesthesia; in addition, menthol`s flavoring substance, peppermint odor, and cooling sensation makes smoking more comfortable and smokers more accommodative (Hoffman, 2011; Lawrence, Cadman & Hoffman, 2011; Watson, Hems, Rowsell, & Spring, 1978). Furthermore, the Flavoring Extract Manufacturers Association considers it safe, and it has been approved for food use by the Food and Drug Administration (Opdyke, 1976). Opponents have agreed; but believe that menthol serves as a recruiting force for new beginners, encourages smoking behavior dependency, and is linked to various health related issues, which lead to high cases of mortality and morbidity, especially among youths (Centers for Disease Control and Prevention 2002; Lawrence et al., 2011; Rising & Wasson-Blader, 2011).

Menthol is added to cigarettes either through direct application to the tobacco itself or is placed in the filter of cigarettes or in the packaging foil (Hoffman, 2011), making the direct inhalation of menthol during smoking process easy and a pathway to smoking behavior, addiction, and dependency (Ahijevych et al., 2004). During the

inhalation process, smokers benefit from the soothing, and cooling substance, and the mint taste, which further encourages more inhalation and weakens the smoker`s willingness to stop. Menthol has been known to be a gateway to continuous smoking of regular or non-menthol cigarettes among youths (Ahijevych et al., 2004; Hoffman, 2011; Randall, 2010). Menthol in cigarettes may lead to persistent and uncontrollable use of some tobacco products by youth which can result in various health challenges including increasing youth morbidity and mortality (Centers for Disease Control and Prevention, 2002; Hoffman, 2011; Moolchan, 2004).

The population for this study was solely youths (adolescence) aged 12 to 19 and their smoking behavior, which is encouraged by the addition of menthol to some cigarettes to reduce the harshness associated with smoking (Ahijevych et al., 2004; Hoffman, 2011). The World Health Organization (WHO, 2017) defined adolescence as the period between ages 10 to 19 which consists of growth, decision making, and changes critical in the transition from childhood to adulthood. Spano (2004) defined adolescence as a period marked by series of physical, mental social/emotional, interpersonal and cognitive changes due to both internal (family, culture and religion) and external influence (peer pressure, media and school environment). The decision to smoke is influenced in part by observation/modeling (family members and friends) and experimentation (Spano, 2004).

I chose this age group for this study because of the three common universal characteristics common among this population: decision making, struggling for identity/independence, and learning by observation (Spano, 2004), which can be

associated with youth smoking behavior. In addition, factors that influence youth behavior and their decision making have been well studied by prominent theorists. According to Rice and Dolgin (2002), Erikson, psychosocial theorists, studied youth identity formation and their struggle between achieving identity and identity diffusion; Piaget, cognitive theorist, studied youths` operational thought and actual experiences and their ability to think in logical and abstract terms; Bronfenbrenner, ecological theorists, studied the context in which adolescents develop and how they are influenced by both internal and external factors such as family, peers, religion, schools, the media, community, and world events; Bandura, social cognitive learning theorist, studied the relationship between social and environmental factors and their influence on youth`s behavior and how they learn through modeling; and Mead and Gilligan, cultural theorist, studied the culture in which the youth grow up.

It is important to learn more about the effect menthol has on smoking initiation and smoking behavior among youth who are drawn to menthol smoking either through direct advertising or peer influence. The results of this study provided a much-needed insight into the factors associated with menthol cigarettes and initiation of smoking among youth. The outcome of this study has led to the recommendations for both primary and secondary smoking prevention interventions among youths. The result of this study may help public health practitioners adequately address the problem of smoking among youth.

The anticipated social change impact of this study is a better understanding of the role of demographic variables and menthol cigarette smoking and the development of

interventions to prevent menthol and regular cigarette smoking. This may result in decreased morbidity and mortality among smokers.

Problem Statement

Mentholated cigarette smoking, like nonmenthol cigarette smoking, is unhealthy and is associated with various adverse health concerns and outcomes (Hoffman, 2011). Menthol cigarette smoking encourages menthol and nonmenthol cigarette smoking behavior, dependency, and tobacco addiction (Hoffman, 2011). Youths are continuously exposed to direct menthol cigarette smoking advertisements, peer pressure, and influence (Moolchan, 2004; Muilenburg et al., 2008; Ogden, 2010).

The substance in menthol makes cigarettes more harmful and makes smokers more exposed to various health concerns (Hoffman, 2011). Various studies have shown that although cigarettes affect people of different ages, gender, race, and ethnicities, those who are the most vulnerable and influenced by menthol are youths (Rising et al., 2011). Other factors include the easy access to mentholated cigarettes, various appealing and enticing TV commercials, and social media, which promote and expose youths to mentholated cigarette, and peer pressure (Moolchan, 2004; Muilenburg et al., 2008).

Of the approximated 600 ingredients in cigarettes, menthol is currently the only tobacco ingredient/additive substance widely promoted and advertised by tobacco companies (Ahijevych et at., 2004). Cigarette companies invest extensively in research that helps them strategize ways to maintain their influence and maximize their profits. Smoking is addictive and causes more than 440,000 deaths annually in the United States (Centers for Disease Control and Prevention, 2002). The purpose of menthol is to make

smoking more appealing (Hoffman, 2011) and it has been very effective in introducing and initiating approximately 4,000 youths to smoking daily, of which 1,000 youths have become active smokers (Rising et al., 2011).

Gap in Literature

It is well documented that mentholated cigarettes are as harmful as regular cigarettes, and it encourages smoking initiation, smoking behavior, and dependency (Ahijevych et al., 2004; Hoffman, 2011). Since the introduction of menthol in 1920, there has been a sharp increase in the sales and use of mentholated cigarettes, which is a contributive factor to the introduction to regular cigarettes smoking, especially among youths (Richardson, et al., 2015). It is also well documented that the effects of smoking increase the morbidity and mortality rate among direct smokers and secondhand smokers (Centers for Disease Control and Prevention, 2002; Rising et al., 2011; Lawrence et al., 2011), which can be attributed to easy access to mentholated cigarettes, continuous exposure to menthol commercial, and peer pressure (Moolchan, 2004; Muilenburg et al., 2008; Ogden, 2010).

There is an ongoing debate regarding the effect of menthol and its influence on youth smoking behavior. For example, proponents have argued that menthol in cigarettes reduces the discomfort associated with smoking (Ahijevych et al., 2004; Perfetti, 1993). Opponents have argued that menthol, in the process of making smoking comfortable, encourages smoking behavior and exposes smokers and non-smokers to various preventable respiratory diseases (Centers for Disease Control and Prevention, 2002; Lawrence et al., 2011; Rising et al., 2011).

Despite the research on the effects of menthol cigarette smoking cited earlier and the impact it is having on youth, there is limited information about predictors of menthol cigarettes smoking among youth ages 12 to 19. Limited knowledge exists regarding the exact adverse health effect of menthol cigarettes and how it may encourage youth to initiate smoking. Hence, more studies are needed to help unravel the complexities relating to the role that menthol plays in getting youth to initiate smoking and which youth may be more susceptible and attracted to menthol cigarette smoking.

Purpose of Study

The purpose of this quantitative study was to explore the factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19 using a quantitative study design. In this study, the independent variables were ethnicity/race, gender, age, and grades (education level); while the dependent variable was type of smoking: menthol versus nonmenthol.

Research Question(s)/Hypotheses.

The research questions and null and alternative hypotheses for this study are as follows:

Research Question 1 (RQ) 1: What is the effect of age on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19?

H_o: There is no effect of age on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19.

H_a: There is an effect of age on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19.

RQ 2: What is the effect of ethnicity/race on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19?

H_o: There is no effect of ethnicity/race on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19.

H_a: There is an effect of ethnicity/race on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19.

RQ 3: What is the effect of gender on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19?

H_o: There is no effect of gender on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19.

H_a: There is an effect of gender on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19.

RQ 4: What is the effect of grades (education level), on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19?

H_o: There is no effect of grades (education level), on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19.

H_a: There is an effect of grades (education level), on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19.

Theoretical Framework

Smoking is a behavior, and the decision to smoke is a conscious willingness encouraged or influenced by several factors such as peer pressure, emotions, experimental purposes, or as a preferred personal method of entertainment/relaxation (Cunningham, 2011). Since this is a behavioral issue, a behavioral theory is needed to understand individual decision making and factors that influences human decisions and behavior. One of the theories that adequately addresses human decision making relating to changes in their behavior is the Fishbein and Ajzen`s (1980) theory of planned Behavior. The concept of the theory of planned behavior (TPB) was proposed by Ajzen in 1980 when he saw the possibility of improving on the predictive power of the theory of reasoned action (TRA). The TRA emphasizes voluntary behavior; however, based on further studies, behavior appears not to be solely voluntary and controlled. Hence, Ajzen believed that adding perceived behavioral control as an additional determinant of intentions and behavior will provide more clarity in understanding human behavior. The addition of perceived behavioral control to the TRA gave birth to the TPB (University of Twente, 2010).

The main purpose of the TPB is the idea that behavior can be deliberate and planned and may help predict an individual`s planned deliberate behavior or in deciding at a specific time and place (University of Twente, 2010). In addition, the theory was intended to explain an individual`s ability to exert self-control over their behavior (LaMorte, 2016). The key component to the TPB is intent (LaMorte, 2016). This intention is influenced by three considerations: behavioral belief (likely consequences of

behavior), normative belief (the normative expectation of others), and the control belief (factors that could interfere with the performance of a specific behavior; University of Twente, 2010). In addition, with the help of the TPB, there is the likelihood that an expected outcome from the risk and benefits of any behavior using a subjective evaluation will be achieved **(**LaMorte, 2016**;** University of Twente, 2010).

The TPB works by predicting that a positive attitude towards an act of a behavior, favorable social norm, and high level of perceived behavioral control are the best predictors for forming a behavioral intention that in turn leads to a displayed behavior or act. For example, if a person sees an item, likes the item, believes that other people like the same item, and believes that he or she can afford that item, then the possibility of getting the item is high. On the other hand, if one or more of the constructs is unfavorable, for example, if the person sees the item, and does not like the item, believes others will not like the item and probably cannot afford it, then the likely hood of buying the item is small (Ajzen, 1991; 2006).

The major predictor of behavior is motive (Ajzen, 1991; 2006). With motive or intention, the TPB emphases behavior as deliberative and planned while acknowledging intention as the predictor of the same behavior (Ajzen, 1991; 2006; University of Twente, 2010). The role of intention supports the fact that people make conscious decisions to adopt a behavior and it is the immediate antecedent of behavior (Ajzen, 1991; University of Twente, 2010). The TPB is based on six constructs. (a) attitude, represents the degree to which an individual considers or evaluates a behavior of interest to be either favorable or unfavorable, (b) behavioral intention represents any motivational factors that could

influence a given behavior; this means that behavior is performed based on how strong the intention is to perform that behavior, (c) subjective norm is a person`s beliefs about whether his or her significant others (friends and families) think he or she should engage in a certain behavior; it relates to a person's perception of how the social environment will influence an intended behavior, (d) social norms, either normative or standard, represent the customary codes of behavior in a group of people or larger cultural context, (e) perceived power is existence of perceived factors capable of facilitating or impeding the performance of a behavior, (f) perceived behavioral control is an individual analysis of the challenges involved in performing any behavior of interest (LaMorte, 2016). These constructs collectively explain how individuals exercise control over their behavior according to the TPB.

The TPB is not perfect for example; it cannot measure actual attitude, intention and unconscious decisions such as those made from reflex actions, and people will not make intelligent decisions all the time (Knabe, 2012). The TPB has been very effective, especially in quantitative research methods in various studies relating to environmental, biological, and social science studies and has been used in understanding human behavior and their decision-making strategies (Knabe, 2012). An important advantage of the TPB is that it can be combined with other theories in a research study, especially in exploring the relationship between similar behavioral cases, with the intention to promote further understanding of human behavior. For example, Lee (2010) combined the TPB, the theory of technology model and expectation confirmation model to predict students' intentions as they relate to online education.

The purpose of the TPB is to accurately predict human intention by understanding human attitude, subjective norms, and perceived behavioral control (Ajzen, 1991). Irani and O'Malley (1998) and Robinson and Doverspike (2006) used the TPB to successfully explore students` and teachers` attitudes concerning online and traditional learning systems. Morris and Venkatesh (2000) used the theory to successfully study the association between workers and their response to work related technology. Moreover, Fortin (2000) used the theory to successfully study human interest in sales coupons; Troung (2009) used the theory to successfully explore the relationship between consumer and the media, and Hsu, Yen, Chiu, and Chang (2006) used the theory to successfully explore online shopping behavior by many shoppers.

Because the Theory of Planned Behavior has been used successfully in behavioral studies, it was beneficial to have it as the framework for this study. In this study, I used the TPB to explore smoking as a behavior and a guide to understanding a smoker`s decision to smoke, and it helped me understand and interpret my findings. The decision to smoke is a perceived behavior, and a perceived behavior addresses individuals` intentions that supports their ability to perform an intended behavior (Ajzen 1991; University of Twente, 2010).

Nature of the Study

The nature of this study addressed quantitative research consistent with understanding the possible association between selected variables and menthol cigarette smoking among the youths ages 12 to19. In this quantitative secondary analysis of

archived data study, I used the Pearson Chi-Square exact test analytical techniques to answer the research questions. The study analysis involved key independent variables, variables that stand alone and do not change based on surrounding factors and dependent or outcome variables, variables that cannot stand alone and changes or are influenced by surrounding factors. Data for this quantitative study were sampled from data collected through the NYTS using the research software SPSS.

The dataset used in this study, NYTS, is public. It is owned and maintained by the CDC and is available to research organizations and individual researchers. The original purpose of the dataset was to provide the data necessary to support the design, implementation, and evaluation of the state and national tobacco prevention and control programs (CDC, 2014c; MacDonald et al., 2001), and to produce an accurate estimate (95%) confidence level of both middle and high school considering the effect of age, gender, ethnicities/race and grade (education level) in exploring the factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19. The dataset has been used to supplement other data, and to provide more comprehensive data for tobacco-related indicators, especially on youth smoking behaviors, youth exposure to secondhand smoke, peer influence, challenges associated with youth smoking cessation, incorporating the effects of smoking into school curriculum, preventing the ability of minors from purchasing cigarettes, and encouraging anti-tobacco (CDC, 2014c; MacDonald, et al., 2001).

The data are maintained and updated periodically and were collected using a stratified, 3-stage cluster sample design to produce a nationally representative sample of

middle school and high school students in the United States. Two hundred and fifty-eight schools were recruited for the survey between 1999 and 2013, and 207 schools participated. A total of 22,007 student questionnaires were completed and returned, and participation was voluntary.

Literature Search Strategy

For the review, I searched, several databases including MEDLINE, CINAHL, ProQuest, PubMED, ScienceDirect, PsycINFO, Academic Search Complete, and Dissertation & Theses at Walden University. Terms related to menthol cigarette smoking were crossed with initiation or cessation behavior concepts, as appropriate. Medical subject heading terms were used to search categorized topic areas in MEDLINE, and PsycINFO. Terms were used to search categorized topic areas, and key titles and abstract terms were used to search for relevant articles. Review of secondary data sources included the National Survey on Drug Use and Health, NYTS, National Health and Nutrition Examination Survey, and National Health Interview Survey. They were used to explore initiation, cessation, and smoking behavior and dependency.

I searched sources dated from 2010 to the present, except in few cases when I referenced data prior to 2010 due to their relevance to this study. I did not include editorials, letters, case report, lectures, news report, comments, legal cases, newspapers articles, technical reports, animal studies and studies outsides of the United States.

Literature Review Related to Key Variables and/or Concepts

Cigarette Smoking Prevalence and Incidence in the United States

Smoking is one of the single largest preventable causes of respiratory illness and death of approximately 480,000 smokers and 41,000 secondhand smokers each year in the United States (U.S Department of Health and Human Services, 2014). In 2014, 40 million American adults were chronic smokers (CDC, 2015). Apart from the cost in lives and environmental pollution, more than $300 billion is spent annually to treat smoke-related diseases, an additional $170 billion is spent on other adult's direct medical expenses, and $156 billion is spent in lost productivity (U.S Department of Health and Human Services, 2014).

Recent data from CDC have shown that smoking prevalence in the United States varies by race/ethnicity, gender, age, economic status, and level of education. For example, the following smoking prevalence rates have been reported: American Indian/Alaska Natives (non-Hispanic) smoking prevalence is 29%, Asians (non-Hispanic) is 9.5%, Blacks is 17.5%, Hispanics is 11.2%, and Whites is 18.2%; by gender, smoking prevalence among men is 18.8% and among women is 14.8%; by age, smoking prevalence among those 18 to 24 years of age is 16.7%, between 25 and 44 is 20.0%, between 45 and 64 is 18.0%, and those 65 years and older is 8.5%; by level of education, the prevalence of smoking among those with less than high school level is 22.8%, GED is 43.0%, high school graduate is 21.7%, some college education is 19.7%, associates degree is 17.1%, and undergraduate degree is 7.9%; by economic status, below poverty level is 26.3%, and those above poverty level is 15.2% (CDC, 2015).

Despite many years of trying, researchers have not been able to come up with ways to eradicate the effect of smoking (CDC, 2015). The introduction of cigarette alternatives such as electronic cigarettes, and hand rolled tobacco products have not prevented the harm associated with smoking (CDC, 2015). Smoking cessation initiatives and the awareness of the effects of smoking are helping to reduce the initiation to smoking but at a very slow rate (CDC, 2015). The prevalence of smoking remains very high especially among youths, and the effect of smoking poses a significant threat to humans and the environment (CDC, 2015).

Menthol Cigarette Smoking Prevalence and Incidence in the United States

There is a high prevalence and incidence of menthol cigarette smoking in the U.S. (CDC, 2014a). In 2010, a statistical age analysis of smokers in the United States showed that 20 million people were menthol smokers, of which 45.0% were ages 18 to 25, 34.5% were ages 26 to 34, and 19.5% were above 35 years (Giovino, Villanti, & Mowery 2013). Between 2008 and 2010, 56.7% youth aged 12 to 17 were menthol smokers compared to a menthol cigarette prevalence of 35.2% among youth and adult smokers (Giovino, et al., 2013). There was a sharp increase in the use and sales of menthol cigarettes between 2004 and 2010 and a sharp decrease in the consumption of nonmenthol cigarette among youth (Giovino, et al., 2013). Data from a study by NYTS conducted between 2004 and 2009 indicated that 49.9% of middle school students and 44.1% of high school students experimented with mentholated cigarettes and later became active cigarette smokers (Giovino et al., 2013).

Apart from the influence of age on menthol smoking, various studies have also been done on the influence of ethnicity/race on menthol cigarettes smoking. For example, the U.S Department of Health and Human Services (1989) study on menthol use among youths showed that 76% of Blacks youths preferred menthol cigarette compared to 23% of White youths. Giovino et al. (2004) confirmed that 68.9% of Blacks youths preferred menthol cigarettes compared to 29.2% of Hispanic youths and 22.4% of White youths. Muilenburg et al., (2008) showed that 70% of Blacks or African Americans youths preferred menthol compared to 30% of White Americans.

Ahijevyeh et al., (2004) studied racial/ethnical differences in the preference of mentholated cigarettes, the association between menthol and cigarette addiction, and the role of menthol in smoking initiation. Their review of existing studies supports the hypothesis that menthol encourages smoking behavior, cigarette addiction, and dependency; especially in regions where menthol is heavily advertised. They revealed that mentholated cigarettes initiated new smokers, mainly American youths (Ahijevyeh et al., 2004). In addition, Giovino, et al., (2004) provided evidence of the influence of menthol in youth smoking initiation, and the Office on Smoking and Health (2014) provided data on the influence of menthol in youth smoking behavior based on age, ethnicity/race, gender, and grade (education level).

Mentholated cigarette smoking has been proven to be an effective pathway to smoking of regular cigarettes, and approximately 4,000 youths experiment with menthol daily, of which approximately 1,000 youths progress to active smokers (Rising et al., 2011). Moolchan (2004) conducted a quantitative study of the Baltimore youths (Black

and White) with a sample size of 1,273 youths, mean age of 15.5 +/- 1.4 years, using a chi-square tests in which a statistical *p* value of < .05 was considered significant. The outcome of the study demonstrated that 93% of those sampled were menthol smokers, and menthol preference was higher among youth than other age groups (Moolchan, 2004).

Marketing of Cigarette Smoking to Youth in the United States

Maintaining current smokers and recruiting new smokers to make up the gap created by those who are successfully quitting smoking are among the top priorities of the tobacco industry (Kreslake, Wayne, Alpert, Koh, & Connolly, 2008). With the help of continuous and effective marketing strategies by the tobacco companies, menthol continues to be well advertised and marketed (Ogden, 2010; Sutton et al., 2003), making 1 in every 4 cigarettes sold in the United States mentholated (U.S. Federal Trade Commission, 2000). In addition, the cigarette companies are very effective in their strategic advertising methods including the claim that menthol is healthy/medicinal, fresh/refreshing/cool/clean/crisp, makes smokers more active/youthful/silly, and full of fun (CDC, 2009). This strategy has led to the increase in first time smokers` rates especially among American youth who continues to receive unwanted attention from tobacco companies (CDC, 2009; Sutton et al., 2003). Currently, mentholated cigarettes are well displayed in magazines, billboards, online, departmental stores, and other areas where youth visit frequently (Gittelsohn et al. 1999; Wakefield, Ruel, & Kaufman, 2002).

In 2013, 31% of cigarettes sold were mentholated, and the percentage of menthol smokers 12 years and older were 19.1% Blacks, 3.6% Asians, 7.8% Hispanics, and 6.5%

Whites (CDC, 2016). In addition to tobacco companies` marketing strategies, most youths or first-time smokers inhale their first direct smoke from a tobacco product offered to them as a gift from friends or loved ones (Huang, Thrasher, Jiang, Li, Fong & Quah, 2012). The three most preferred cigarettes by youths and learners are Marlboro, Newport, and Camel due to effective advertising (CDC, 2009). The 2004 and 2006 NYTS analyzed by the CDC in 2009 revealed that there is a slight difference in preference between middle school kids and high school kids, and from their analyses, they determined that age and level of education might have played a factor (CDC, 2009; Enomoto, 2000).

Adverse Health Outcomes of Smoking

Every year in the U.S. approximately 440,000 people die from tobacco-caused disease, making it the leading cause of preventable death in the U.S. (American Lung Association, n.d.). Another 41,000 youths are exposed to secondhand smoke in the United States (American Lung Association, n.d.). Tragically, each day thousands of kids still pick up a cigarette for the first time leading to a cycle of addiction, illness and death (The American Lung Association, n.d.). There is strong scientific evidence that tobacco is injurious to health (CDC, 2014 b). Smoking can cause cancer almost anywhere in the body (American Cancer Society, 2014). Smoking, like other chronic diseases is responsible for 90% of all lung cancer, 75% of chronic bronchitis and emphysema and 25 % of ischemic heart disease cases (CDC, 2014b). It is harmful both to the smoker and the non-smoker who is exposed to side stream smoke (American Cancer Society, 2014). Cigarette smoking also causes children and teens to be short of breath and reduced

stamina, both of which can affect their athletic performance and other physical activities (CDC, 2014a).

Adverse Health Outcomes of Menthol Use

Menthol is a pathway that makes smoking initiation easy for first time smokers and helps to reinforce the interest in smoking in long time smokers (Hoffman, 2011). It also makes the pathway to smoking addiction possible and smoking cessation very difficult (Ahijevych et al., 2004). Wickham (2015), acknowledged that menthol exacerbates smoking behavior and promotes nicotine dependence. Wickham asserts that the effects of smoking is attributed to the influence of widely promoted menthol cigarette smoking advertising. As a substance, menthol is added to cigarettes to decrease its harshness and enhance taste (Ahijevych et al., Perfetti, 1993). It consists of a flavor substance (Hoffman, 2011; Lawrence et al., 2011) with a peppermint odor and cooling sensation (Watson et al., 1978). This flavor creates a smooth taste capable of encouraging further use that may lead to dependency (Lawrence et al. 2011; Rising et al., 2011). Ahijevych et al., (2004) discussed how the cooling substance in menthol serves as a local anesthesia, a characteristic associated with addiction. The substance in menthol makes cigarettes more harmful and makes smokers more exposed and vulnerable to various health concerns (Hoffman, 2011). The most vulnerable are youth, most of whom are under pressure from their peers (Rising et al., 2011). It is well documented that menthol is harmful, it enables deeper and the altering of inhalation frequency, and it is a pathway to smoking initiation (Hoffman, 2011).

Smoking initiation remains very high among youths and varies among different race and ethnicities (Giovino, et al., 2004; Muilenburg et al., 2008; U.S. Department of Health and Human Services, 1989). It has also been well studied that those who got initiated to smoking through menthol find it difficult to quit compared to those whose initialization to smoking was from nonmenthol cigarette (Moolchan, 2004). In addition, loyalty to smoking among menthol smokers is higher than nonmenthol smokers (Moolchan, 2004). Gan, and Cohen, (2008) compared the chemical components of both menthol and nonmenthol cigarettes and revealed that the prevalence of menthol cigarettes is higher among youth than nonmenthol. Furthermore, an investigation by the tobacco companies did not find any significant difference in the nicotine or glucuronidated nicotine metabolites level in the urine specimen collected from menthol and nonmenthol smokers (Hoffman, 2011; Signorello; Cal. Q. 2009), and no differences were noted in the plasm cotinine level (Ho et al., 2009). Menthol smokers have a higher serum cotinine level (1333.8 +/- 40.1 nmol/L) compared to nonmenthol smokers (1230.3 +/- 24.5 nmol/L) and 294.3 ng/ml menthol, compared to 238.8 ng/ml nonmenthol) (Gan, et al., 2008). Clark, Gautam, and Gerson, (1996); found elevated carbon monoxide in blood sampled of menthol smokers compared to nonmentholated cigarette. Concerning menthol and lungs health, a study of 18 menthol and 56 nonmenthol smokers by a tobacco company found that tidal ratio – a measure of the lung volume, to be 1.52 for menthol smokers and 1.79 for nonmenthol smokers (Hoffman, 2011).

Surprisingly, a study of 190 smokers: 29 mentholated cigarette smokers, and 161 nonmentholated cigarette smokers; did not reveal a notable difference in the level of

nicotine spike, and there is little or no difference in cotinine half-life between menthol (23.1 +/- 7.9 hours) and nonmenthol (18.1 +/- 8.1 hours) smokers (Ahijevych et al., 2004). In a study of 142 schizophrenic smokers, and non-schizophrenic smokers` blood cotinine level, shown no association between menthol and schizophrenia, and no significant difference in the influence on menthol among these groups, even with menthol smokers having a higher serum nicotine and cotinine level than nonmenthol smokers was observed (Ahijevych et al., 2004). Heck, (2009), found no differences in carbon monoxide level in either menthol or nonmenthol smokers` blood samples. In a longitudinal study of randomly selected 5,886 smokers, to find out if both menthol smokers and nonmenthol smokers would show a significant difference in response to chronic obstructive pulmonary disease; Scanlon et al., (2000), reported that menthol did not lead to any significant lung decline; moreover, Hoffman (2011) did not find an association between menthol and its effect on respiration.

From the above discussion of the published literature, there is conflicting evidence regarding the differences in effects between mentholated cigarette and nonmentholated cigarette on smokers` behavior and their health. In addition, there is a wide range of methods used to access the risks and outcome of smoking menthol; however, there is still a lack of consensus on the effects of menthol. This provides an opportunity for further research and exploration needed on the outcomes and effects of menthol among smokers.

Smoking Prevention Efforts Among Youths

There are various ways to discourage teen smoking. Preventing early smoking or early experimental smoking among youth is critical (CDC, n.d.). It is well documented that if smoking behavior is not started by age 26, the tendency for this behavior to be cultivated after age 26 is very limited (CDC, n.d.). A collaborative method is needed for the development of effective youth smoking prevention interventions. There are various initiatives that have helped in reducing teen smoking. For example, the opportunity to openly discuss smoking preventive measures, challenges and influence of peers in schools including health education in school curriculum has given middle and high school teachers the opportunity to discuss the effect of teenage smoking and how peer pressure can be avoided (CDC, n.d.).

Furthermore, family involvement with their children to discuss and discourage teenage smoking has been very effective. Some communities have stood against continuous cigarette advertisement in open places near kids` play grounds and community centers (CDC, n.d.). There are other strategies that were incorporated but have not been very effective and need to be revisited. For example, increasing the price of cigarettes and prohibiting the sales of cigarette to minors have not effectively reduced smoking initiation (CDC, n.d.; Richardson et al., 2015).

Descriptive Research Design and Smoking Research

I proposed a descriptive study to explore the factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19. Descriptive study is a very effective way to analyzing the

association that may or may not exist between two or more variables (Lomax & Li, 2013). Descriptive studies have been successful in the past in analyzing and demonstrating the association of menthol and smoking prevalence among youths.

Garces et al. (2004) conducted a study on the association between cigarette smoking and quality of life after lung cancer diagnosis. The purpose of the study was to explore the relationship between cigarette smoking and quality of life (QOL) among lung cancer survivors using the lung cancer symptom scale (LCSS) as a standard measurement (Garces et al., 2004). 1,506 patients were randomly selected to participate in the study between 1999 and 2002. In the study, the different participant`s LCSS score were compared using univariate independent group testing and the multivariate linear models. In addition, participant`s LCSS score were analyzed using a scale of 0 to 100 points. Other considered factors were participant`s age, gender, stage of illness, and time of LCSS evaluation. The outcome of the study was that a higher LCSS will correspond with a low QOL. In addition, there is an evidence that persistent cigarette smoking after the diagnostic of lung cancer negatively impact patient`s QOL scores (Garces et al., 2004).

Researchers at the Center for Advancing Health conducted a study in 2014 to explore the association between high body mass index (BMI) and cigarette smoking in teens. The purpose of the study was to examine whether overweight or obese teens are at higher risk for substance abuse (Center for Advancing Health, 2014). Data for the study was collected from the National Longitudinal Study of Adolescent Health that specialized in American teenagers. 15,000 obese teens were randomly selected to participate in the study. Height and weight were used to determine body mass index (BMI) and

participant`s use of cigarettes, alcohol and marijuana were key questions asked in the questionnaires (Center for Advancing Health, 2014). This study was needed to provide more understanding on the increasing rise in smoking behavior and alcohol consumption among obese teens. The outcome of the study showed an association between high BMI and cigarette smoking in teenagers. Obese teenagers are more likely to abuse alcohol or marijuana than average weight teens (Center for Advancing Health, 2014).

Kao, Buka, Kelsey, Gruber, and Porton (2010) conducted a study using an exploratory ecological investigation in 2010 to explore the relationship between the rates of cancer and autism. The purpose of the study was to determine if an association exists between the prevalence of autism and the incidence of cancer (Kao et al., 2010). Data for this study was obtained from the U.S. Department of Education via the Individuals with Disabilities Education Act (IDEA) from 2000 to 2007, and cancer incidence data were obtained from CDC from 1999 to 2005. For this study, the Spearman rank test was used to calculate all possible pairwise combinations of annual autism rate and the incidence of specific cancers. The outcome of the study showed an association between autism rates and the incidence of in situ breast cancer; in addition, few significant associations were observed between autism prevalence and the incidence cancer in both male and female (Kao et al., 2010).

The research that I described above involved quantitative research designs which have been successfully used in analyzing and exploring association between variables. A quantitative design was appropriate for this study as I explored the possible association

between factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19.

Definitions

The following key terms will be used in this study.

Menthol: Menthol is a substance that is added to cigarette to mint the harshness usually associated with smoking so that smoking becomes more comfortable to smokers and accommodative to non-smokers (Hoffman, 2011).

1. *Smoking Dependency*: Smoking dependency is an addiction to smoking. It is a condition in which a smoker cannot stop smoking even though he/she is aware of the health risk associated with smoking (Mayo Clinic, 2017).
2. *Smoking Prevention Measures*: This is a strategy that involves a comprehensive multi component measure designed to help prevent smoking (U.S. Department of Health & Human Services, 2017).
3. *Youth*: Youth is a period of transition from the dependence to independence usually between 15 to 24 years of age (United Nation, n.d.).

Assumptions

Assumptions play a very important role in this study that without them the research problem may not exist, and research question may remain unanswered. Assumptions are expectations and the extent and willingness to anticipate and accept what is believed to be true even when the chances of accuracy are limited (Cambridge University Press n.d.). It was assumed that the information from the dataset will help

answer the research questions and it provided further clarity needed in understanding the role of menthol in youth smoking initiation because the data were collected and have been maintained by CDC in a scientifically rigorous manner. It was also assumed that the studies reviewed were accurately described. It was also assumed that the information in the dataset is correct and the data collection method did not violate ethical procedures.

Scope and Delimitations

Two criteria were used to govern the scope of this study: the inclusion and exclusion. For inclusion, participants were randomly selected from both middle and high school from different background such as socioeconomic, race, gender, and ethnicity. Age was strictly between 12 to 19. Participants were obligated to provide a parental or guardian consent and complete a questionnaire. For exclusion, no youth below and above the recommended age participated and none were accepted without a parental or guardian consent. Furthermore, I was not able to explore the reasons people smoke apart from the addictive properties of tobacco products as has been clearly demonstrated in the scientific literature. Although important, I was not able to explore how long the smokers intend smoke, to what extent their decision to smoke was attributed to peer pressure, depression, and social economic factors and other factors. Furthermore, this study was not intended to explore the adverse health outcomes associated with short and long-term smoking among youth who smoke menthol cigarettes compared to those who smoke regular or nonmenthol cigarette.

Significance

Menthol cigarette smoking has been shown to be a pathway to smoking regular or nonmenthol cigarettes among youths (Ahijevych et al., 2004; Hoffman, 2011; Randall, 2010). Menthol in cigarettes led to eventual and persistent use of tobacco products by youth resulting in adverse health outcomes and associated morbidity and mortality among this population (CDC, 2002; Hoffman, 2011; Moolchan, 2004). The results of this study provided a much-needed insight into the factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19. The outcome of this study may lead to recommendations that supported both primary and secondary smoking prevention interventions for this population.

The anticipated social change impact of this study is a better understanding of the role of demographic variables on menthol cigarette smoking and the development of interventions to prevent menthol and regular cigarette smoking. This may result in decreased morbidity and mortality among persons who initiate smoking at an early age.

Summary

The prevalence and incidence of cigarette smoking among American youth is very high (CDC, 2014a), and the substance in menthol made their smoking initiation easy (Hoffman, 2011). The sales of menthol cigarette are increasing due to the effective marketing strategies by tobacco companies to maximize profit and attract youths (Ogden, 2010; Sutton & Robinson, 2003). For example, in the United States, approximately 4,000 youths experimented with menthol daily of which approximately 1,000 youths progress

to active smokers (Rising et al., 2011). In addition, of the approximately 20 million menthol smokers in 2010, 45.0% were between ages 18 to 25, 34.5% were between ages 26 to 34 and 19.5% were people above 35 years (Giovino et al., 2013). Between 2008 and 2010, 56.7% youth ages 12 to 17 were menthol smokers compared to menthol cigarette prevalence of 35.2% among youth and adult smokers (Giovino, et al., 2013), and between 2004 and 2009, 49.9% of middle school students and 44.1% of high school students experimented with mentholated cigarette, and they later became active cigarette smokers (Giovino, et al., 2013).

Menthol encourages smoking behavior, cigarette addiction, and dependency especially in regions where menthol is heavily advertised. It is a pathway to smoking of regular cigarettes that ultimately led to respiratory diseases and death (American Cancer Society, 2014; American Lung Association, n.d.; CDC, 2009; CDC, 2014a; CDC, 2014b). With limited information, the role of menthol and its adverse effect on lives still requires more investigation. I proposed a quantitative research study to explore the factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19.

Conclusion

Youth smoking is a serious public health issue and requires continuous attention from all public health sectors. Smoking is harmful to both smokers and non-smokers (CDC, 2009). The tobacco companies added menthol to cigarettes to make smoking more convenient and accommodating; however, the addition of menthol encouraged and

supported smoking behavior, served as a major initiating force for first time smokers and it is a contributive factor to some health-related illnesses (CDC, 2002).

This study provided a better understanding of the factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19, and the development of intervention that addressed menthol as a pathway to regular cigarette smoking which resulted in the decrease in morbidity and mortality among persons who initiate smoking at an early age.

The study of menthol and its link to smoking behavior especially among youths remains an ongoing process and requires further studies. In section 2 of this proposal, I provide a detailed description of the methodological approach for this study including a detailed plan for data analysis.

Section 2: Research Design and Data Collection

Menthol is a pathway to cigarette smoking especially among youth 12 to 19 years of age. Studies have shown that smoking is harmful to both smokers and non-smokers; and it is a leading cause of most preventable respiratory illnesses (CDC, 2009; Hoffman, 2011). Menthol, a component that is added to some cigarettes to make smoking more comfortable and convenient for smokers, became a leading cause to the high prevalence of smoking initiation and addiction, especially among youth ages 12 to 19 (Hoffman, 2011). Menthol works by masking any property in cigarette that usually makes smoking uncomfortable (Hoffman, 2011). The influence of menthol supports smoking behavior, serves as a major initiating force for first time smokers, and it is a contributive factor to some health-related illnesses (CDC, 2002). Smoking is a behavior, and the decision to smoke is a conscious willingness encouraged or influenced by several factors such as peer pressure, emotions, experimental purposes, or as a preferred personal method of entertainment/relaxation (Cunningham, 2011). Youth smoking is a serious public health issue and requires continuous attention from all public health sectors.

The purpose of this quantitative study was to explore the factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19 using a quantitative study design. The goal of this study was to provide a better understanding of the role of demographic variables and the factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19. Findings from this study may help in the development of interventions to prevent menthol and

regular cigarette smoking that resulted in the decrease in morbidity and mortality among persons who initiated smoking at an early age.

In this section, I discuss the key fundamentals of the study`s research design and data collection method. I describe the variables, the research questions, population selection and size, sampling and its procedure, a data analysis plan, primary research questions, and threats to validity.

Research Design and Rationale

This study was an analysis of key variables: dependent and independent variables. Variables are set of values that exist in an experimental or research study (Helmenstine, 2016). Dependent variables are variables that can be changed when being measured or tested due to surrounding influence or factors (Helmenstine, 2016). Independent variables are variables that stands alone and do not change when tested or measured, and are not influenced by surrounding factors (Helmenstine, 2016). In this study, the independent variables were ethnicity/race, gender, age (12 to 19), and grades (education level); while the dependent variables or outcome variable was type of smoking: menthol versus nonmenthol cigarettes.

I used a quantitative research process to test and examined any association that existed among the variables in this study. The choice of a quantitative research design for this study instead of a qualitative or mixed method was attributed to the various advantages of a quantitative design and the role it played in analyzing data, experimental design, and methodologies used in any study. For example, quantitative design can use

statistics to generalize a finding, analyzes complex problems, and simplifies them to few manageable variables, and linking them using the concepts of association/relationship, can establish cause and effect in highly controlled circumstances, and it is capable of testing theories or hypotheses with little or no difficulties (Creswell, 2009; Sukamolson, 2007). This quantitative research design was aligned with the research questions, which provided a better understanding in exploring the factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19.

The research questions and corresponding null and alternative hypotheses for this study were as follows:

Research Question 1 (RQ) 1: What is the effect of age on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19?

H_o: There is no effect of age on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19.

H_a: There is an effect of age on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19.

RQ 2: What is the effect of ethnicity/race on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19?

H_o: There is no effect of ethnicity/race on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19.

H_a: There is an effect of ethnicity/race on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19.

RQ 3: What is the effect of gender on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19?

H_o: There is no effect of gender on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19.

H_a: There is an effect of gender on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19.

RQ 4: What is the effect of grades (education level), on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19?

H_o: There is no effect of grades (education level), on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19.

H_a: There is an effect of grades (education level), on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19.

A quantitative study was employed to provide more understanding of the original data and how they related and provided more insight to menthol and youth smoking behavior: an important step needed in providing a further understanding in the role of menthol and its influence on youth smoking behavior. In this study, quantitative study helped keep the study focused, supported the study`s theory, reliability and objectivity, used statistics to generalize the study`s finding, reduced and restructure any anticipated study`s statistical problems, analyzed any relationship between variables, established the study`s cause and effect in highly controlled circumstances, and assumed that the study sample size is a true representative of the population (Creswell, 2009). Furthermore, a quantitative design was preferred for this study because it offered a direct approach to the study process and helped in the identification of significant association between study

variables (Creswell, 2009). Descriptive studies can be a very effective way to explore the association that may or may not exist between two or more quantifiable variables (Lomax et al., 2013). Descriptive studies have been successful in the past in demonstrating the association of menthol and smoking prevalence among youths. This study design was consistent with understanding the factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19 using a quantitative study design.

Methodology

Data Source

The dataset from which data were drawn for this study was the NYTS, established in 2014, owned and maintained by the CDC and was made accessible to different research organizations and researchers (Office on Smoking and Health, 2014). The data were collected periodically, and the CDC ensured that the process of gathering the data followed the basic ethnical codes research programs and that the dataset was continuously updated and compared with prior data to identify and monitor any changes (Office on Smoking and Health, 2014).

Study Population

The study population consisted of males and females ages 12 to 19 from public and private schools with an emphasis on middle and high school Grades 6 through 12 in the United States (Office on Smoking and Health, 2014). These schools included alternate schools, special education schools and the department of defense operated

schools. All participants were voluntary and randomly selected by the NYTS (Office on Smoking and Health, 2014). These participants were individuals from different social economic backgrounds, races and ethnicities. Participants` ages were verified to ensure that they are within 12 to 19 years of age (Office on Smoking and Health, 2014). Individuals below the age of 12 were excluded because my aim was to explore the factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19 using a quantitative study design.

The NYTS has a history of adequate participation relating to youth tobacco surveys. For example, previously, the NYTS school participation, averaged 86%, with a low of 75%. Student participation averaged 91% with a low of 88%, and the overall response rate has averaged 78% (Office on Smoking and Health, 2014). Currently, the population sampled consisted of 258 schools, of which 207 schools participated, which was 80.2% participation, and from these participating schools, 24,084 questionnaires were sent out, and 22,007 were completed and returned by participating students, yielding a student overall participation rate of 91.4% (Office on Smoking and Health, 2014). These were the same data I used for my study population, and these data are from the following CDC database: https://www.cdc.gov/tobacco/data_statistics/surveys/nyts

Sampling Strategy

For the original secondary dataset, random sampling was used, and participants were randomly selected, and open-ended questionnaires, and parental consent mailed to all participants with a returned address envelope attached for their convenience. Upon

receipt of the questionnaire, the participants filled it out and returned it with their parental consent in the enclosed returned envelop by mail. The use of questionnaires was ideal because of the difficulties in assembling participants at the same time and for convenience. The privacy of those who seek not to be known as smokers especially those in the early stage of initiation and those in the decision phase of either to or not to become a smoker were priority. No returned questionnaires were accepted without a parental consent.

The sampling process were based on two main categories: school selection, and student selection. At the school selection, a total of 220 schools (middle school 113 and high school 77 and 30 small schools) were selected from primary sampling unit (PSU). At the student selection, only enrolled students were selected from classes, and course schedules provided the assistance needed for class selection by each school that agreed to participate, and duplication, and multiple sample were strictly avoided (Office on Smoking and Health, 2014). The sampling strategy used by the NYTS aimed to develop a national estimate of tobacco use and exposure to pro-tobacco, and anti-tobacco influences among students enrolled in grades 6 to 12 (Office on Smoking and Health, 2014). The objectives of the general sampling design framework supported an estimated tobacco-related knowledge, attitudes, and behaviors in a national population of public, and private school students who were enrolled in Grades 6 through 12 in the United States (Office on Smoking and Health, 2014). The sampling design also produced a national estimate at 95% confidence level with a margin of error of 5% by school level (middle school and high school), by grade (6, 7, 8, 9, 10, 11, and 12), by sex (male and

female), and by race/ethnicity (non-Hispanic white, non-Hispanic black, and Hispanics; Office on Smoking and Health, 2014). In addition, the sampling design supported different subgroups with emphasis on grade, sex, and race/ethnicity within the school level domains even as precision levels varies due to sub-population size differences (Office on Smoking and Health, 2014).

I used a convenience sampling approach for this study to obtain my study sample. A convenience sampling (availability sampling) is a non-probability sampling method that depended on prior data collection based on availability and convenience of the study participants without additional requirements. There are several reasons why convenience sampling is preferred by many researchers. For example, it is a simple sampling method that makes it easy to gather research subjects, it helps in generating the study`s hypothesis especially in pilot studies, save time in data collection and easy to implement (Dudovskiy, 2011).

From the original survey, the time frequency for data collection was annually depending on findings, and the *n* (sample size) of the entire dataset is 258 sampled schools out of which 207 participated (Office on Smoking and Health, 2014). I selected my sample from the 2014 dataset because it provided adequate representation of all major ethnic groups, and the data were within a recent time frame. The 2014 NYTS sampling design and the allocation of strata was proportional, and it prevented the need for oversampling (Office on Smoking and Health, 2014). Furthermore, it provided adequate information, and analyzed the national data on long-term, intermediate, and short-term indicator`s key to the design, implementation, and evaluation of the Tobacco Prevention

and Control Program (TCP) concerning middle and high school youths` tobacco-related beliefs, attitudes, behaviors, and exposure to pro- and anti-tobacco influences, making it possible for states to compare their estimate of prevalence of youth tobacco use with the national data (Office on Smoking and Health, 2014). In addition, the 2014 dataset obtained from the NYTS, is a public document, and assessable to researchers.

Sample Frame

The study sample frame consisted of the National Center for Education Statistics (NCES) whose files serves as the Common Core Data (CCD) for private and public school (PSS) that were surveyed, and the frame dataset was incorporated from Market Data Retrieval Inc. (MDR Inc) which is a commercial vendor (Office on Smoking and Health, 2014). One of the major advantages of using frame built from multiple sources is that it increased the coverage and scope of the survey and allow for a greater participant. In this survey, using multiple sources increased the coverage by 15.5% among public schools, and a 46% among non-public high schools (Office on Smoking and Health, 2014).

Recruitment Procedures for the Original Dataset

Participants in the 2014 NYTS were selected from various schools in the United States. Recruitment began in May 2013 with calls to State Departments of Education and Health. As a requirement, support for the survey were sought and letters of support were obtained from various state agencies and participating school districts. Participants agreed on a unanimous date and time frame that was convenient for all participating

schools, and district for the survey implementation to optimize the efficiency of data collection, while accommodating school schedules. In selecting a date, convenience to the school and its calendar were considered. In addition, for convenience, schools within the same geographical region were grouped, and scheduled together to facilitate efficient travel time, and survey implementation within selected schools (Office on Smoking and Health, 2014). The use of electronic calendar on a secure shared drive to facilitate communication and to avoid scheduling two schools for the same data collection, on the same day, provided addition advantages such as reduced duplication of participants, and saved time. (Office on Smoking and Health, 2014).

Survey Instrumentation and Operationalism of Constructs for the Original Dataset

There were several instruments used in the survey and in the collection of data by the NYTS on key short-term, intermediate, and long-term tobacco prevention and control outcome indicators. For example, the 2014 survey instruments used a total of 81 questions, with the first 5 questions consisting of student demographic information, and the remaining questions concentrated on obtaining information relating to a comprehensive set of tobacco-related topics such as prevalence of tobacco product use, knowledge of participant`s attitudes toward tobacco use, protobacco and antitobacco media and advertising, minors' access to tobacco products, nicotine dependence, cessation attempts, exposure to second-hand smoke, harm perceptions, exposure to tobacco product warnings, and tobacco use prevention school curricula (Office on Smoking and Health, 2014).

Another method used in the survey was the combination of State Youth Tobacco Survey (YTS) and NYTS in a team effort to develop the data necessary to support the design, implementation, and evaluation of state and TCP. In addition, NYTS data supplement other existing surveys, such as the Youth Risk Behavior Surveillance System (YRBSS), by providing more comprehensive data of tobacco-related indicators for both middle school (grades 6–8) and high school (grades 9–12) students (Office on Smoking and Health, 2014). These instruments were formally used successfully by the NYTS on tobacco-related indicators such as bidis, cigarettes, cigars, kreteks, tobacco pipes, smokeless tobacco, snus, dissolvable tobacco products, hookahs, and electronic cigarettes; including exposure to secondhand smoke, smoking cessation, school curriculum, minors' ability to purchase or obtain tobacco products, knowledge and attitudes about tobacco, familiarity with pro-tobacco, and anti-tobacco media messages (Office on Smoking and Health, 2014).

Operationalization of Variables

In the original survey, various variables were operationalized to make sure the variables are measurable and quantifiable. The 2014 variables used in the survey included age, race/ethnicity, gender, and grade (educational level). To accomplish the operationalization of variables in the original study, one of the instruments used was questionnaires. Questionnaires were used in the collection of data by the NYTS on key short-term, intermediate, and long-term tobacco prevention, and control outcome indicators. Emphasis were on student demographic information, and a comprehensive set

of tobacco-related topics on youth and smoking related challenges (Office on Smoking and Health, 2014).

How Variables are Measured and Manipulated

To ensure accurate prevalence estimates among racial/ethnic minority groups, multiple strategies were initiated especially in two major ethnic groups: non-Hispanic black, and Hispanic students for analyzing the effect of over sampling, and how a double class selection of participants contained sufficient proportion of minority students. For manipulation and measurement, the use of measure of size (MOS) which has been previously used to increase the probability of participants including schools using probability selection proportional to size (PPS) were employed, this made the effectiveness of MOS in achieving oversampling to be dependent (Office on Smoking and Health, 2014). In addition, parameters such as thresholds for double class selection, and PSU allocation to strata, to balance the dual goals of overall precision, and minority group targets were manipulated. The manipulation of these variables provides an overall precision as oversampling leads to larger variances for overall estimates that has been shown to reduce design effects of the conducted study, for survey estimates (Office on Smoking and Health, 2014).

Sample Size

The NYTS was designed to produces prevalence estimates within an error of 5% at a 95% accuracy. For the original study, the sample size was specified in terms of precision of the resulting estimates which produced an outcome of a margin of error

(MOE) of 5% (± 5%) at a 95% level of precision which satisfied the estimated standard by grade, sex, and racial/ethnic groups among participants (Office on Smoking and Health, 2014). The survey estimates for the sampled subgroups included middle and high school (grades 6-8 combined) and high school (grades 9-12 combined). In calculating the sample sizes for the 2014 NYTS, robust approach was made by assuming a conservative combined rate of 77%, which was slightly lower than the historical overall response rate of 78.3% (Office on Smoking and Health, 2014). Furthermore, sampling parameters were developed to lead total projected sample size more than 21,000 participants, and more than 10,000 participants per level (Office on Smoking and Health, 2014).

To achieve the target and the sample size, two key domains: middle school, and high school levels, considered different target sample sizes per grade which was a requirement needed for high school and middle school which were classified by size upon enrollments. The reason for this was to ensure that a sampled school of a given size classification meets the required standard for participation and can support the student sample sizes. This sample sizes achieved the desired goals, and target in terms of accuracy (Office on Smoking and Health, 2014).

Furthermore, sampling parameters were adjusted to reflect changing demographics of the in-school population of middle and high school students (Office on Smoking and Health, 2014). This minimum sample size ensured that estimates by race/ethnicity meet the required precision levels for each school level (Office on Smoking and Health, 2014). For the survey, the target sample sizes were approximately 3,000 participating students per grade which supported the precision estimated by individual

grade estimates based on 1,500 students). The premise was that each high school provided student samples for 4 grades while each middle school provided student samples for 3 grades (Office on Smoking and Health, 2014).

For this secondary analysis or archived data study, I conducted a post hoc power analysis due to the sample size of about 100 people that were obtained.

Data Analysis Plan

The nature of this study focused on quantitative research consistent with exploring the factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19 using a quantitative study design.

I included both descriptive and inferential statistical analyses methods in this study as described in the following sections.

Descriptive Statistical Analysis Plan

I provided a description of the data used, their basic features, summaries, sample measures used and illustration. I described the study population as well as trends in the data. In addition, I used measures of central tendencies such as mean scores as well as tables. One of the advantages of a descriptive statistical analysis is that it presents a quantitative description of data in a manageable and visual form by helping to decrease the complexities, and the volume of data to a simplified, and manageable form without diminishing important data information (Trochim, 2006).

Inferential Statistical Analysis Plan

I used inferential statistical analysis (Chi-Square and regression analysis) to reach inferential conclusion on the study, and to explain the association between variables including significant differences in the study`s average performances, post hoc power analysis to determine the power of the sample size, and crosstabulation to analyze, and understand the role of the study`s categorical variables.

Threat to Validity

I am confident in the internal validity of this study because I sampled from an ongoing dataset that was carefully controlled by CDC with respect to scientific rigor. Although there is currently no published study that used this dataset, however; this dataset obtained from the NYTS, has been extensively used since 1999 to provide accurate data necessary to support the design, implementation, and evaluation of state and national TCPs in 50 different states in America, and have the support of the CDC, and Food and Drug Administration (FDA). In addition, the NYTS data have been very helpful in supplementing other existing surveys, such as YRBSS in providing comprehensive data for tobacco-related indicators for both middle school (grades 6–8) and high school (grades 9–12) students, and a national estimate of 95% confidence level with a margin of error of 5% (Office on Smoking and Health, 2014). Another important factor concerning the authenticity of the NYTS is that the NYTS data frame was constructed from multiple viable sources such as the National Center for Education and Market Data Inc. (Office on Smoking and Health, 2014). The NYTS data also served as an essential benchmark against which the TCPs can assess the extent of youth tobacco

use and have been extensively used in six tobacco health related healthy people 2020 objectives (Office on Smoking and Health, 2014).

I am also confident in the external validity of this study. The data used covered a very wide population of young people that were randomly selected, consisting of different ethnicities, and socioeconomic background, race, and gender which provided information as to what extent the study`s conclusion can be generalized. For example, 256 school were sampled out of which 207 school participated making 80.2% participation rate; and of the 24,084 student questionnaires, 22,007 were completed and returned (Office on Smoking and Health, 2014). In addition, the external validity of the study included the various middle, and high schools in the United States that participated in the study (Office on Smoking and Health, 2014).

One limitation of this study is that I conducted a secondary analysis of the data and I was therefore removed from the original intent of the survey and study, however; because I used a reputable data source, I have confidence in the rigor of the original data collection, and current data maintenance protocols assured by CDC.

Ethical Procedures

The data I received for this study were entirely de-identified to prevent me from having any personal information about the participants. I reported results in the aggregate, and not individual data. I applied to the Walden Institutional Review Board (IRB) for permission to analyze data and conducted the study and did not analyze any data until I received written permission to do so by the IRB. Upon review of my proposal

and application to conduct the study, IRB gave me the permission to conduct the study. My IRB approval number is 07-25-17-0557064.

Summary

The high incidence of smoking among youth ages 12 to 19 is a major public heath challenge that requires continuous attention. In addition, the high prevalence of youth smoking has been linked to menthol which remains the gateway to regular cigarette smoking especially among youth 12 to 19. The addition of menthol to some cigarettes makes smoking more attractive to first time smokers and encourages continuous smoking by regular smokers. Menthol encourages smoking initiation, led to smoking addiction, and it is responsible for approximately 500,000 deaths annually.

In this study, I answered the research questions. To answer these research questions, key fundamentals such as variables, design choice, population selection, size, sampling procedure, data analysis plan, survey instrumentation, operationalism of constructs, and how they will contribute to providing a path to the study`s result analysis served as guide.

The data analysis plan for this study included both descriptive and inferential statistical analysis of data. Post hoc analysis included a post hoc power analysis. The data source for this study was drawn from the NYTS, established in 2014, owned and maintained by CDC, and constantly compared with prior data to identify, and monitor any changes.

The potential social change impact was a better understanding of the role of demographic variables and menthol cigarette smoking, and the development of intervention to prevent menthol, and regular cigarette smoking. Study findings may lead to an eventual decrease in morbidity, and mortality among smokers. In section 3 of this proposal, I provided a detailed description of the data collection of secondary dataset which included the report of descriptive statistics that appropriately characterized the sample, reported statistical analysis using tables, and figures to illustrate results, and summarized the answers to the research questions approach for this study.

Section 3: Presentation of the Results and Findings

The purpose of this quantitative study was to explore the factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19 using a quantitative study design. Section 3 includes descriptive and inferential analysis including the Pearson Chi-Square Test derived from the secondary data retrieved from the NYTS 2014. To actualize this, four key research questions were answered: (a) What is the effect of age on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19? (b) What is the effect of ethnicity/race on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19? (c) What is the effect of gender on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19? (d) What is the effect of grades (education level) on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19?

In this section, I provide a comprehensive description of the data collection from the secondary dataset, time frame, response rate, checked for any discrepancies in the NYTS 2014 dataset, provide a concise description of the sample demographic, sample representativeness, univariate and bivariate characteristics of the study including the sample analysis, and then present my descriptive and statistical analysis findings. I also present tables to illustrate my finding and results.

I conclude with a concise summary of the findings, and results for the research questions, and their hypotheses.

Data Collection of Secondary Dataset

I used archived data gathered between 1999 and 2013 with the NYTS, which was established in 2014, and is owned and maintained by the CDC. The data from the NYTS 2014, were appropriate for this study because it is a nationally recognized survey system that has been successfully used for a long time, and in conjunction with State Youth Tobacco Survey (SYTS). The NYTS data were developed to provide the data necessary to support the design, and implementation, and to evaluate state and national (TCPs). The NYTS also developed a national estimate of tobacco use and exposure to pro and anti-tobacco influences such as the role of advertising, effects of social media and smoking relative among students enrolled in Grades 6 to 12 (Office on Smoking and Health, 2014).

In addition, the NYTS data supplemented other existing surveys, such as the YRBSS by providing comprehensive data for tobacco-related indicators for both middle school (grades 6–8) and high school (grades 9–12) to analyze tobacco use, exposure to secondhand smoke, smoking cessation, youth ability to purchase or obtain tobacco products, knowledge and attitudes about tobacco, and familiarity with pro tobacco and anti-tobacco media messages (Office on Smoking and Health, 2014). Supplementation was also used to assess nicotine dependence, smoking cessation attempts, harm perceptions, and exposure to tobacco product warnings (Office on Smoking and Health, 2014). NYTS data were collected using surveys and questionnaires. Participating school directors agreed on a date and time frame that was convenient for all participating schools, and districts to optimize the efficiency of data collection and maximum

participation. In addition, for convenience, schools within the same geographical region were grouped and scheduled together (Office on Smoking and Health, 2014). To prevent duplication and to save time, electronic calendars were used to facilitate communication among participating schools (Office on Smoking and Health, 2014).

Participants were randomly selected from various participating schools in the United States. As a requirement, support for the survey were sought, and letters of support were obtained from various state agencies and participating school districts.

Time Frame and Response Rate

The time frame for the data collection in the original 2014 NYTS dataset was between 1999 through 2013. Questionnaires consisting of 81 questions were sent out to 24,084 participating students, and a total of 22,007 questionnaires were completed and returned yielding a response rate of 91.4% (Office on Smoking and Health, 2014).

Discrepancies in the Dataset

The dataset is nationally accepted for accuracy and is highly used in conjunction with other surveys conducted by other organization, owned and managed by the CDC. I found no discrepancies in the dataset. However, the original data collectors indicated that the dataset contains missing data that were expected random errors since participants were randomly selected. I anticipated that missing data could lead to inaccurate findings in my outcome; hence, I addressed the issue by identifying the missing data in my analysis.

Univariate Analysis

Descriptive Demographic Characteristics of the Sample

Demographic data from the NYTS 2014 dataset were reported by the survey participants and complied in the archived survey data from the 220 participating schools out of the 258 schools selected for the PSU (Office on Smoking and Health, 2014). Demographic variables of this study were gender, grade, age, and race/ethnicity. For adequate analysis, participants were divided into three groups by the original data collector, using unweighted frequency, which is the raw percentage of participants to the survey as well as weighted percentage, which are the percentages that have been statistically adjusted to compensate for higher or lower rates of participation in the survey among various demographic groups. These weighting factors were applied to each student record to adjust for nonresponse and for varying probabilities of selection as well as to ensure that the weighted proportions of students in each grade matched national population proportions (Office on Smoking and Health, 2014).

The original data collector applied weighting factors to each student record to adjust for nonresponse and for varying probabilities of selection (Office on Smoking and Health, 2014). Osborne (2013) stated that weighting helps in eliminating standard errors and increases the chance for a better estimated parameter but cautioned that binary logistic regression model may be influenced. For example, the NYTS (2014) dataset requires adjustment to ensure that weighting proportions of participants (youths) in the participating grades is very like the standard national population proportion, and to increase external validity. To address this problem, only weighted data were used in this

study. The weighting system is important to this study because it allowed additional clarity, estimate adequately, and eliminate known errors by directing inquiries into data that have been processed, and edited for accuracy.

For this study, only the weighted percentage were analyzed, and in drawing comparisons among participants responses to the survey. Comparisons based on this study variables were presented consistently throughout the study especially when differences were statistically significant. For example, it was useful to provided statistical analysis on the smoking initiation rate among participants, and to estimate the mean, median and mode in age 12 to 19 smoking frequency of the youth sampled.

Representative of the Sample

The study population consists of males and females ages 12 to 19 from public and private schools with emphasis on middle and high school grades 6 through 12 in the United State (Office on Smoking and Health, 2014). These schools were alternate schools, special education schools, and the department of defense operated schools. All participants, and schools were randomly selected by the NYTS, and participants were voluntary (Office on Smoking and Health, 2014). These participants were individuals from different social economic backgrounds, races, and ethnicities. Participants` ages were verified to ensure that they were within 12 to 19 years of age (Office on Smoking and Health, 2014). As stated earlier, 258 school were sampled out of which 220 school participated making 80.2% participation rate, and of the 24,084 student questionnaires, 22,007 were completed and returned. From this participation, the NYTS data produced a prevalence estimates within an error of 5% at a 95% accuracy. From the original study,

the sample size was specified in terms of precision of the resulting estimates which produced an outcome of a margin of error (MOE) of 5% (± 5%) at a 95% level of precision which satisfied the estimated standard by grade, sex, and racial/ethnic groups among participants (Office on Smoking and Health, 2014). The survey estimated for the sampled subgroups included middle and high school (grades 6-8 combined) and high school (grades 9-12 combined).

To maintain representativeness, the NYTS (2014) employed a stratified, three-stage cluster sample design to produce a nationally representative sample of middle school, and high school students in the United States to account for the percentage of the known demographic characteristics: ethnicity/race, age, grade (educational level) and gender to avoid bias (Office on Smoking and Health, 2014). This made the 2014 portion of the NYTS a representative of the general population, and I am confident in the external validity of my findings because data used covers a very wide population of young people that were randomly selected, consisting of different ethnicities, socioeconomic background, race, and gender which provided information as to what extent the study`s conclusion were generalized.

The sampling process was based on two main categories: school selection, and student selection, and supported different subgroups with emphasis on grade, gender, and race/ethnicity within the school level domains even as precision levels varies due to sub-population size differences (Office on Smoking and Health, 2014). The sampling parameters were adjusted to reflect changing demographics of the in-school population of middle and high school students and this minimum sample size ensures that estimates by

race/ethnicity meet the required precision levels for each school level (Office on Smoking and Health, 2014). For this secondary analysis or archived data study, I conducted a post hoc power analysis due to the sample size of about 100 persons that was obtained.

Statistical Analysis of Variables

The independent variables analyzed in this study were gender, age, grade, and ethnicity/race. The descriptive statistics of these variables are shown in tables 1 through 4, and the participants` responses to the survey questionnaires are summarized in Tables 5 through 14. The different questions, and the responses from participants helped in answering this study research questions, and they provided a better understanding of the purpose of this quantitative study including exploring the factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19 using a quantitative study design.

Gender of participants: boys and girls. The weighted percentage of the sampled population, and the smoking rate between male and female are illustrated in table 1. The 2014 survey was conducted between 1999 and 2013. 50% of the survey participants were boys, and 49% were girls. All participants were between the ages of 12 to 19, high and middle school students; whose participation was approved in part by the submission of a parental consent. The answers to the research questions showed that there was no significant difference in the smoking behavior between male and female, and the influence of menthol on youth smoking behavior is not based on gender. Table 1 shows the gender of participants.

Table 1

Gender of Participants Ages 12 to 19: Boys and Girls (n=99)

		Frequency	Percentages	Valid Percentage
Valid	Boys	50	28.2	50.5
	Girls	49	27.7	49.5
	Total	99	55.9	100.0
Missing		78	44.1	
Total		177	100.0	

Ages of participants. The weighted percentage of the sampled participants illustrating their ages is shown in table 2. The NYTS weighted the youths that participated, according to their ages and identified the differences in the age group surveyed. The survey shows that among the different age groups, those within the age of 12, 13, 14, 15, 16 and 17 has the highest rate of smoking initiation why those within the age of 18 and 19 has the lowest initiation rate. Table 2 shows the ages of participants.

Table 2

Ages of Participants (n=101)

		Frequency	Percentage	Valid Percentage
Valid	12 years of age	14	7.9	13.9
	13 years of age	16	9.0	15.8
	14 years of age	16	9.0	15.8
	15 years of age	16	9.0	15.8
	16 years of age	16	9.0	15.8
	17 years of age	14	7.9	13.9
	18 years of age	8	4.5	7.9
	19 years of age	1	6	1.0
	Total	101	57.1	100.0
Missing		76	42.9	
Total		177	100.0	

Grade (education levels) of participants. The NYTS weighting on participants educational level is summarized in table 3. The grade of participants was between 6 to 12 grades from the participating middle and high school. This grade was reported as the actual grade of participants during the time of the survey. As illustrated in table 3, 9th grades had higher participation rate than any other grades. The survey shows that the weighted percentage of the participants were significantly close. The original data

collectors believed that the reason for this close similarity in the initiation rate was because of continuous smoking advertisement that targets this population irrespective of age (CDC, 2014). Table 3 shows the grade (education level) of participants.

Table 3.

Grade (education levels) of Participants Ages 12 to 19 (n=115)

		Frequency	Percentage	Valid Percentage
Valid	6th grade	14	7.9	12.2
	7th grade	16	9.0	13.9
	8th grade	15	8.5	13.0
	9th grade	29	16.4	25.2
	10th grade	14	7.9	12.2
	11th grade	14	7.9	12.2
	12th grade	13	7.3	11.3
	Total	115	65.0	100.0
Missing		62	35.0	
Total		177	100.0	

Ethnicities/race of participants. The NYTS weighting on participants ethnicity/race is summarized in table 4. The five main ethnic groups that participated in the study were Hispanic, Asians, African Americans (Blacks), American Indians, and Whites within the United State, and the District of Columbia. After weighting the five participated ethnicities: Hispanics were 7.3%, American Indian were 2.8%, Asian were 2.8%, African American (Blacks) were 10.2%, and Whites were 33.3%. The survey showed that although there is a very high prevalence of smoking initiation of the Hispanic youths; however, this rate is almost twice as high among African American weighted, and extremely higher among whites. Table 4 shows the ethnicity/race of participants.

Table 4

Ethnicity/Race of Participants Ages 12 to 19 (n=100)

		Frequency	Percentage	Valid percentage
Valid	Hispanics	13	7.3	13.0
	American Indians	5	2.8	5.0
	Asians	5	2.8	5.0
	Black (African Americans).	18	10.2	18.0
	Whites	59	33.3	59.0
	Total	100	56.5	100.0
Missing		77	43.5	
Total		177	100.0	

Factors that Support Participants Ages 12 to 19 Choice of Mentholated Cigarettes

Many factors influenced and encouraged participants` preference of mentholated cigarettes over nonmentholated cigarettes among youths 12 to 19. These factors include taste, advertisement, comfort (decrease of smoking harshness/masking cigarettes properties), FDA approval, peer/family influence, personal preference, and experimentation (American Cancer Society, 2014; American Lung Association, n.d.; CDC, 2009; CDC, 2014 a; CDC, 2014 b). However, the NYTS weighted percentage on the factors that influenced participants` choice of menthol over nonmentholated cigarettes mainly on advertising of mentholated cigarettes in public places, social media, and family/peer influence (Office on Smoking and Health, 2014).

Family members/peers. The weighted percentage of the sampled population that were influenced by a menthol cigarette smoking family member/peers was summarized in table 5. It summarized the responses of participants when asked how they are being influenced by their smoking family member and peers. In addition, participants were asked how many of them are influenced to smoke because they lived with a smoker or someone very close to them is a smoker; 54.2% said that they were influenced to smoke because they lived with a smoker or someone very close to them is a smoker, and 2.3% said they were sometimes influenced to smoke because they lived with a smoker or someone very lose to them is a smoker. Table 5 shows the influence of smoking family members/peers on participants.

Table 5

Influence of Smoking Family Members/Peers on Participants Ages 12 to 19 (n=100)

		Frequency	Percent	Valid Percentage
Valid	Definitely yes	96	54.2	96.0
	Sometimes	4	2.3	4.0
	Total	100	56.5	100
	Missing	77	43.5	
Total		177	100.0	

Mentholated cigarette smoking. Menthol is a substance that is added to cigarette to enhance comfort while smoking. Menthol is not harmful, however when it is added to cigarettes to make smoking which is an unhealthy harmful behavior to be more comfortable; and in the process, mask any property in cigarettes which usually makes smoking uncomfortable. Menthol makes smoking initiation easy and smoking cessation difficult (Ahijevych et al., 2004; Gardiner, 2003; Hoffman, 2011). In this study, I examined the influence of menthol especially on youth smoking behavior, and the factors that promotes the use of menthol cigarettes among these vulnerable population. Smoking which is a leading contributor and cause of most preventable respiratory diseases especially among youth has been extensively studied, and a link has been established between youth smoking behavior, and menthol (CDC, 2009; Hoffman, 2011).

Addictiveness of mentholated cigarettes. The weighted percentage of the sampled population that responded to addictiveness of mentholated cigarette questionnaire is illustrated in table 6. The table includes a summary of the responses of participants on their view on the addictiveness of mentholated cigarettes. Participants were asked if mentholated cigarette is addictive, 10.2% believed mentholated cigarette smoking is less addictive, 18.6% believed they are equally addictive, 3.4% believed they are more addictive, 2.3% were not sure, and 22.0% do not know if mentholated cigarette smoking is addictive because of the limited information they have about the addictiveness of smoking mentholated cigarettes at the time of the survey. Table 6 shows the participants` perception of smoking addictiveness due to menthol.

Table 6.

Participants Ages 12 to 19 Perception of Smoking Addictiveness Due to Menthol (n=100)

		Frequency	Percent	Valid percentage
Valid	Less Addictive	18	10.2	18.0
	Equally Addictive	33	18.6	33.0
	More Addictive	6	3.4	6.0
	Unaware of the Addictiveness of menthol	4	2.3	4.0
	Not sure/undecided	39	22.0	39.0
	Total	100	56.5	100.0
Missing		77	43.5	
Total		177	100.0	

Menthol encourages smoking behavior among youths. The weighted percentage ranges of the sampled population that responded to the role menthol plays in their initiation to smoking is illustrated in table 7. It summarized the responses of participants views on how menthol influenced their smoking behavior, and their choice between mentholated cigarettes versus nonmentholated cigarettes. 32.2% of the participants strongly believes menthol influences their smoking behavior, 19.2% believes menthol influence their smoking behavior, 4.0% do not strongly believe that menthol influences their smoking behavior, while 2.3% strongly do not believe that smoking influences their

smoking behavior. Table 4 shows participants who believe menthol encourages their smoking behavior.

Table 7

Participants Ages 12 to 19 Who Believe Menthol Encourages Smoking Behavior (n=102)

		Frequency	Percent	Vital Percentage
Valid	Strongly believe	57	32.2	55.9
	Believe, but not strongly	34	19.2	33.3
	Disagree but not strongly	7	4.0	6.9
	Strongly disagree	4	2.3	3.9
	Total	102	57.6	100.0
Missing System		75	42.4	
Total		177	100	

Harmful chemicals in mentholated cigarettes. The weighted percentage of the sampled population that responded to the harmful chemicals in mentholated cigarettes questionnaire is illustrated in table 8. The table includes the ranges of responses of participants` view on the harmful chemicals in cigarettes. Participants were asked if they were concerned about the harmful chemicals in mentholated cigarette. 35.4% of the participants said they are never concerned, 13.6% stated they were rarely concerned, 10.7% stated they were sometimes concerned, 4.0% of the participants stated they were

often concerned, and 3.4% of the participants were never concerned. Table 8 shows the participants` concerns about the harmful chemicals in cigarettes.

Table 8

Participants Ages 12 to 19 Concerns About the Harmful Chemicals in Cigarettes (n=101)

		Frequency	Percentage	Valid Percentage
Valid	Never concerned	45	35.4	44.6
	Rarely concerned	24	13.6	23.8
	Sometimes concerned	19	10.7	18.8
	Often concerned	7	4.0	6.9
	Very often concerned	6	3.4	5.9
	Total	101	57.1	100
Missing		76	42.9	
Total		177	100.0	

Unclear/inadequate warning labels. The weighted percentage of the sampled population that responded to the unclear/inadequate warning labels on cigarettes packages is illustrated in table 9. The table includes ranges of the participants` views on how unclear warning labeling of cigarettes packages, and how they mislead participants, and influences their smoking behavior. In this table 9 participants were asked of their concern about not seeing or understanding the warning label on mentholated cigarette packages. 9.6% of the participants said they were never concerned about not seeing the

warning label on mentholated cigarette packages, 12.4% of the participants said they were rarely concerned, 11.9% of the participants said they were sometimes concerned, 7.9% of the participants said they were most of the times concerned, and 14.7% of the participants said they were always concerned. Table 9 shows participants` concerns about the unclear warning labels on cigarettes packages.

Table 9

Participants Ages 12 to 19 Concerns About the Unclear Warning Labels on Cigarette Packages (n=100)

		Frequency	Percentage	Valid Percentage
Valid	Never concerned	17	9.6	17.0
	Rarely concerned	22	12.4	22.0
	Sometimes concerned	21	11.9	21.0
	Most of the times concerned	14	7.9	14.0
	Always concerned	26	14.7	26.0
	Total	100	56.5	100.0
Missing		77	43.5	
Total		177	100.0	

Smoking cessation: menthol. The weighted percentage of the sampled population that responded to the NYTS questionnaire on quitting smoking is illustrated in table 10. Participants were asked if there were thinking of quitting smoking. 13.6% of the

participants said yes, and will quit smoking within the next 30 days, 6.2% of the participants said that they will quit smoking within the next 6 months, 4.5% of the participants said that they will quit smoking within the next 12 months, 9.6% of the participants said that they will quit smoking but not within the next 12 months, and 22.6% of the participants said that they do not intend to quit smoking at all. Table 10 shows participants who are seriously thinking of quitting smoking despite the flavor from menthol.

Table 10

Participants Ages 12 to 19 Who are Seriously Thinking of Quitting Smoking Despite the Flavor from Menthol (n=100).

		Frequency	Percentage	Valid Percentage
Valid	Yes, within the next 30 days	24	13.6	24.0
	Yes, within the next 6 months	11	6.2	11.0
	Yes, within the next 12 months	8	4.5	8.0
	Yes, but not within the next 12 months	17	9.6	17.0
	No, I am not thinking of quitting smoking	40	22.6	40.0
	Total	100	56.5	100.0
Missing		77	43.5	
Total		177	100.0	

Effects of mentholated smoking on smokers. The weighted percentage of the sampled population who believed people harm themselves when they smoke cigarettes (menthol or nonmenthol) is illustrated in table 11. This table includes the ranges of responses of participants` view of whether people harm themselves when they smoke. 1.7% of the participants believed that smokers do not harm themselves when they smoke mentholated cigarettes, 4.5% of the participants believed smokers do harm themselves a little when they smoke, 20.9% of the participants believed that smokers harm themselves slightly when they smoke, and 29.4% of the participants believed that smokers harm themselves a lot when they smoke. Table 11 shows participants perceptions of whether smokers harm themselves when they smoke.

Table 11

Participants Ages 12 to 19 Perception of Whether Smokers Harm Themselves When They Smoke (n=100)

		Frequency	Percentage	Valid Percentage
Valid	No harm	3	1.7	3.0
	Little harm	8	4.5	8.0
	Some harm	37	20.9	37.0
	A lot of harm	52	29.4	52.0
	Total	100	56.5	100.0
Missing		77	43.5	
Total		177	100.0	

Multivariate Analysis

Multivariate statistical analysis is a method consisting of multiple advanced techniques designed and used for examining and analyzing relationships that exist among multiple variables at the same time. It is basically used in studies that involve more than one dependent/outcome variable, and more than one independent (predictor) variable or both (Hall, n.d.)

In this study, I used the multivariate regression analysis to illustrate the influence, and relationship between the dependent, and the independent variables. Using the 2014 NYTS data, I conducted a statistical analysis to provide an understanding of the potential association between the dependent variable, and the independent variables used in the study, and how they influenced participants smoking behavior, and their choice between menthol versus nonmenthol cigarettes. These associations are summarized in Tables 12 through 16, and they provided supporting information that aided in answering the study research questions.

Table 12 is a case processing summary, and it includes a general summary of participants` (boys and girls) ages 12 to 19 at a 100% rate. This helped in the prediction of menthol versus nonmenthol used among participants ages 12 to 19 which was illustrated in table 13.

Table 12

Case Processing Summary (n=115)

Unweighted Cases (a)		N	Percent
Selected Cases	Included in analysis	99	86.1
	Missing Cases	16	13.9
	Total	115	100.0
Unweighted Cases		0	.0
Total		115	100.0

a. If weight is in effect, see classification table for the total number of cases.

Table 13 is a classification table that illustrates the prediction of smoking behavior (menthol versus nonmenthol) among participants. According to this table, the model used is correctly classifying the outcome for 99% of the case which is a very good result.

Table 13

Classification Table Predicting Smoking (Menthol Versus Nonmenthol) Among Participants Ages 12 to 19.

Observed			Predicted Smoking (menthol versus nonmenthol smoking) among participants		
			Yes	No	Percentage Correct
Step 1	Smoking (menthol versus nonmenthol smoking) among participants	Yes	4	0	100.0
		No	1	58	98.3
	Overall Percentage				99.0

a. The cut value is .500

Table 14 is an illustration of the Omnibus Tests of Model Coefficients which used chi-square tests to see if there is a significant difference between the Log-likelihoods of the baseline model, and the new model. From the illustration, the chi-square is highly significant (chi-square =126.872, df =14, p <.000). The chi-square values are the same for step, block, and model. The values are $p < .001$, which indicates the accuracy of the model improves when we add any explanatory variables.

Table 14

Omnibus Tests of Model Coefficients

		Chi-Square	df	*p* value
Step 1	Step	126.872	14	.000
	Block	126.872	14	.000
	Model	126.872	14	.000

Table 15 is an illustration of a contingency table for Hosmer and Lemeshow test. According to the test above, our model is a good fit to the data ($p > 0.05$).

Table 15

Contingency Table for Hosmer and Lemeshow Test (a; b)

		Smoking (menthol versus nonmenthol among participants = yes		Smoking (menthol versus nonmenthol among participants = no		
		Observed	Expected	Observed	Expected	Total
Step 1	1	8	8.000	0	.000	8
	2	9	9.000	0	.000	9
	3	13	13.000	0	.000	13
	4	10	10.000	1	1.000	11
	5	0	.000	58	58.000	58

Hosmer and Lemeshow Test (b)

Step	Chi-Square	df	*p* value
1	.000	3	1.000

In table 16, the study variables in the equation were illustrated as they played important role in the study and in answering the research questions. It also summarized the relationship between the variables and analyzes the participants smoking behavior. However, no predictor found to be significantly associated with the dependent variables.

Table 16

Variables in the Equation

		B	S.E.	Wald	df	*P*	OR	95% CI. For OR Lower	Upper
Step 1a	Age			.000	6	1.000			
	13 yrs. of age	.000	44937.110	.000	1	1.000	1.000		.000
	14 yrs. of age	18.900	73303.327	.000	1	1.000	161547480.700		.000
	15 yrs. of age	18.900	64511.793	.000	1	1.000	161547488.608		.000
	16 yrs. of age	18.900	64511.792	.000	1	1.000	161547489.267		.000
	17 yrs. of age	18.900	59969.618	.000	1	1.000	161547492.034		.000
	18 yrs. of age	18.900	58508.705	.000	1	1.000	161547494.011		.000
	Grade			.000	3	1.000			
	8th Grade	.000	55886.058	.000	1	1.000	1.000		.000
	9th Grade	.000	33225.108	.000	1	1.000	1.000		.000
	10th Grade	.000	23778.482	.000	1	1.000	1.000		.000
	Females	.000	23205.422	.000	1	1.000	1.000		.000
	Constant	-21.203	11147.524	.000	1	.998	.000		.000

a. Variable(s) entered on step 1: Age, Ethnicity/Race, Grade, Gender.

Statistical Analysis Findings Organized by Research Questions and Hypotheses

Inferential Statistical Analysis

Inferential statistical analysis was used in this study to infer information from the sample data about a population, and to test hypotheses, and deriving estimates applicable to this study. It helped me to reach conclusion/findings and in making a concise judgement of the probability of observed differences between what happened or what might happen by chance in this study.

This study answered four research questions, and their corresponding hypotheses. In answering the research questions, I used the Pearson Chi Square test, and regression analysis. Pearson Chi Square test is appropriate for the categorical variables of this study because it compares two opposite factors. For example, menthol versus nonmenthol as used in this study.

Post Hoc Power Analysis

I conducted a post hoc power analysis. A post hoc power is usually referred to as the observed power and it is the statistical power of the study that was conducted based on the effect size estimate which measures the strength of the study`s results (Hunt, n.d.). The effect size is the actual findings of the study, it is pure, and does not depend on the sample size (Hunt, n.d.). According to the regression analysis, no significant predictors were found, and the effect size was very small (Odds ratio close to 1). Therefore, the achieved power was inadequate (0.52), and we needed at least double the number of cases (about 200) to obtain a satisfactory power >0.80. This issue will be discussed in the recommendation part in section 4.

Research Question 1

The first research question was: What is the effect of age on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19?

I analyzed data for this research question using cross tabulation (Table 24) and answer the research question using the Pearson Chi-Square Test (Table 25). The NYTS 2014, sample of participants ages 12 to 19 shown how different people are influenced based on their ages. The crosstabulation (Table 17) illustrates the influence menthol had on participants based on their different ages, and how participants (ages 12 to 19) were influenced by either menthol or nonmenthol cigarettes smoking. 14% of the participants among the 12 years age groups were menthol cigarettes smokers, 16% of the participants among 13 years age groups were menthol cigarettes smokers, 16% of the participants among the 14 years age groups were menthol cigarettes smokers, 16% of the participants among the 15 years age groups were menthol cigarettes smokers, 16% of the participants among the 16 years age groups were menthol cigarettes smokers, 14% of the participants among the 17 years age groups were menthol cigarettes smokers, and 8% of the participants among the 18 years age groups were menthol cigarettes smokers.

Table 17

Crosstabulation: Age of Participants

Age of Participants Smoking (Menthol Versus Nonmenthol) Among Participants

		Smoking (menthol versus nonmenthol smoking) among participants		
		Yes	No	Total
Age of Participants 12 years	Count	14	0	14
	% within age participants	100.0%	0.0%	100.0%
	% within smoking (menthol versus nonmenthol smoking) among participants	35.0%	0.0%	14.0%
Age of Participants 13 years	Count	16	0	16
	% within age participants	100.0%	0.0%	100.0%
	% within smoking (menthol versus nonmenthol smoking) among participants	40.0%	0.0%	16.0%
Age of Participants 14 years	Count	10	6	16
	% within age participants	62.5%	37.5%	100.0%
	% within smoking (menthol versus nonmenthol smoking) among participants	25.0%	10.0%	16.0%

(table continues)

		Smoking (menthol versus nonmenthol smoking) among participants		
		Yes	No	Total
Age of Participants 15 years	Count	0	16	16
	% within age participants	0.0%	100.0%	100.0%
	% within smoking (menthol versus nonmenthol smoking) among participants	0.0%	26.7%	16.0%
Age of Participants 16 years	Count	0	16	16
	% within age participants	0.0%	100.0%	100.0%
	% within smoking (menthol versus nonmenthol smoking among participants	0.0%	26.7%	16.0%
Age of Participants 17 years	Count	0	14	14
	% within age participants	0.0%	100.0%	100.0%
	% within Smoking (menthol versus nonmenthol smoking) among participants	0.0%	23.3%	14.0%

(table continues)

		Smoking (menthol versus nonmenthol smoking) among participants		
		Yes	No	Total
Age of Participants 18 years	Count	0	8	8
	% within age participants	0.0%	100.0%	100.0%
	% within smoking (menthol versus nonmenthol smoking) among participants	0.0%	13.3%	8.0%
Total	Count	40	60	100
	% within age participants	40.0%	60.0%	100.0%
	% within Smoking (menthol versus nonmenthol smoking) among participants	100.0%	100.0%	100.0%

Hypotheses: There is no association between age, and menthol cigarette smoking among youth ages 12 to19.

This study hypothesized that there is no significant association between age and menthol cigarette smoking among youth 12 to 19. In table 18, I compared the actual value against a critical value found in a Pearson Chi-Square Test distribution (where degrees of freedom were calculated as number of rows minus one times the number of columns minus one), to make a hypothesis conclusion with 95% confidence, and the value labeled asymptotic significance (which is the *p* value of the Pearson Chi-Square Test statistic) should be less than .05 (which is the alpha level associated with a 95%

confidence level). In my analysis, the Pearson Chi-Square Test value is 84.375 (a), and the *p* value of <.001 with a minimum expected count of 3.20 from the (a) 2 cells (14.3%) which have an expected count of less than 5 computed for two side tables. The *p* value indicates that the variables are not independent of each other, and that there is no statistically significant relationship between the categorical variables. Although the Chi-Square Test was significant, the regression analysis demonstrated that there was no significant association between the independent and dependent variables; thus, I accepted the null hypothesis, and concluded that there was no association between age, and menthol cigarettes smoking among youth ages 12 to 19. To explain these contradictory results between the bivariate and regression analysis, I conducted additional Chi-Square tests between all the independent variables used in the regression model. All the predictors were significantly also associated with each other, thus the regression model is not able to explain the dependent variable, given these specific variables. Recommendations for future research to address this limitation will be provided in detail in section 4. Table 18 is a Chi-Square test that illustrates and compared the actual value against the critical value found in a Pearson Chi-Square Test distribution, and the value labeled asymptotic significance.

Table 18

Chi-Square Test Supporting the Findings of Research Question 1

	Value	df	*p* value
Pearson Chi-Square	84.375 (a)	6	.000
Likelihood Ratio	113.432	6	.000
Linear-by-Linear Association	67.583	1	.000
N of Valid Cases	100		

a. 2 cells (14.3) have expected count less than 5. The minimum expected count is 3.20.

Research Question 2

The second research question was: What is the effect of ethnicity/race on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19?

I analyzed data for this research question using a cross tabulation (Table 19) and answered) the research question using a Pearson Chi-Square Test (Table 20). The NYTS 2014, sampled participants ages 12 to 19 from five ethic groups (Hispanics, American Indians, Asians, Blacks (African Americans), and Whites), in comparison between participants use of menthol versus nonmenthol cigarettes.

Table 19 is an illustration of how participants (ages 12 to 19) from different ethnicities/race were influenced by menthol cigarettes. Among the Hispanics, 13% of the participants were menthol cigarettes smokers, 5% were menthol cigarettes smokers

among American Indians, and among the Asians who participated in the study, 5% were menthol cigarettes smokers and among the Blacks (African Americans), 18% of participants were menthol cigarettes smokers. The study also shows that among the Whites participants, 59% were menthol cigarettes smokers. This revealed that there was a statistical difference in the use of mentholated cigarettes by ethnicities. From the archive data, there is a significant indication that the association between menthol, and the five different ethnicities differs in their use of menthol. In addition, important differences on the rate of menthol use among participants were found along ethnical lines. However, when these ethnic groups were individually compared to the youth smoking preference of mentholated cigarettes versus nonmentholated cigarettes, I found also that an association existed.

Table 19

Crosstabulation

Ethnicity/Race of Participants Ages 12 to 19 Smoking (Menthol Versus Nonmenthol)

		Smoking (menthol versus nonmenthol smoking) among participants		
		Yes	No	Total
Ethnicity/Race Hispanics	Count	13	0	13
	% within Ethnicity/Race of participants	100.0%	0.0%	100.0%
	% within smoking (menthol versus nonmenthol smoking) among participants	32.5%	0.0%	13.0%
American Indians	Count	5	0	5
	% within Ethnicity/Race of participants	100.0%	0.0%	100.0%
	% within smoking (menthol versus non-menthol smoking) among participants	12.5%	0.0%	5.0%

(table continues)

		Smoking (menthol versus nonmenthol smoking) among participants		
		Yes	No	Total
Asians	Count	5	0	5
	% within Ethnicity/Race of participants	100.0%	0.0%	100.0%
	% within smoking (menthol versus nonmenthol smoking) among participants	12.5%	0.0%	5.0%
Blacks (African Americans)	Count	17	1	18
	% within Ethnicity/Race of participants	94.4%	5.6%	100.0%
	% within smoking (menthol versus nonmenthol smoking) among participants	42.5%	1.7%	18.0%
Whites	Count	0	59	59
	% within Ethnicity/Race of participants	0.0%	100.0%	100.0%
	% within smoking (menthol versus nonmenthol smoking) among participants	0.0%	98.3%	59.0%

(table continues)

		Smoking (menthol versus nonmenthol smoking) among participants		
		Yes	No	Total
Total	Count	40	60	100
	% within Ethnicity/Race of participants	40.0%	60.0%	100.0%
	% within smoking (menthol versus nonmenthol smoking) among participants	100.0%	100.0%	100.0%

Hypotheses: There is no association between ethnicity/race and menthol cigarette smoking among youth ages 12 to 19

I hypothesized that there is no significant association between ethnicity/race and menthol cigarette smoking among youth 12 to 19. In table 20, I compared the actual value against a critical value found in a Pearson Chi-Square Test distribution (where degrees of freedom were calculated as number of rows minus one times the number of columns minus one) and to make a hypothesis conclusion with 95% confidence, the value labeled asymptotic significance (which is the *p* value of the Pearson Chi-Square Test statistic) should be less than .05 (which is the alpha level associated with a 95% confidence level). In my analysis, the Pearson Chi-Square Test value is 96.065 (a) and the *p* value of <.001 with a minimum expected count of 2.00 from the (a) 4 cells (40.0%) have expected count of less than 5 computed for two side tables. The *p* value indicates that the variables are not independent of each other, and that there is no statistically

significant relationship between the categorical variables. Although the Chi-Square test was significant, regression analysis demonstrated that there was no significant association between the independent, and dependent variables; thus, I accepted the null hypothesis and concluded that there was no association between race/ethnicity and menthol cigarettes smoking among youth ages 12 to 19. Recommendations for future research to address this limitation will be provided in detail in section 4.

Table 20

Chi-Square Test Supporting the Findings of Research Question 2

	Value	df	*p* value
Pearson Chi-Square	96.065 (a)	4	.000
Likelihood Ratio	126.878	4	.000
Linear-by-Linear Association	64.438	1	.000
N of Valid Cases	100		

b. 4 cells (40.0%) have expected count less than 5. The minimum expected count is 2.00.

Research Question 3

The third research question was: What is the effect of gender on the type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19?

I analyzed data for this research question using cross tabulation (Table 21) and answered the research question using Pearson Chi Square Test (Table 22). The NYTS 2014, sampled participants ages 12 to 19 of gender (boys and girls) in comparison

between their use of menthol versus nonmenthol cigarettes. The NYTS 2014, sample of participants ages 12 to 19 revealed that there was no statistical difference in the use of mentholated cigarettes among gender. Table 21 is an illustration of how participants (ages 12 to 19) gender were influenced by menthol. Among the boys ages 12 to 19, 50.5% were menthol cigarettes smokers, and among the girls ages 12 to 19, 49.5% who smoked menthol cigarettes. Although, there were conflicting studies on the rate at which mentholated cigarettes influences gender.

From the archive data, there is a significant indication that the association between menthol, and gender differs in their use of menthol. In addition, important differences on the rate of menthol use among participants were found along gender line. However, when gender was individually compared to the youth smoking preference of mentholated cigarettes versus non-mentholated cigarettes, I found also that an association existed.

Table 21

Crosstabulation:

Gender of Participants (Boys and Girls) Ages 12 to 19 Smoking (Menthol Versus Nonmenthol)

			Smoking (menthol versus nonmenthol smoking) among participants		
			Yes	No	Total
Gender of participants (boys and girls)	Boys	Count	40	10	50
		% within gender of participants	80.0%	20.0%	100.0%
		% within smoking (menthol versus nonmenthol smoking) among participants	100.0%	16.9%	50.5%
	Girls	Count	0	49	49
		% within gender of participants	0.0%	100.0%	100.0%
		% within smoking (menthol versus nonmenthol smoking) among participants	0.0%	83.1%	49.5%
Total		Count	40	59	99
		% within gender of participants	40.4%	59.6%	100.0%
		% within smoking (menthol versus nonmenthol smoking) among participants	100.0%	100.0%	100.0%

Hypotheses: There is no association between gender and menthol cigarette smoking among youth ages 12 to 19

I hypothesized that there is no significant association between gender, and menthol cigarette smoking among youth 12 to 19. In table 22, I used a Chi-Square Test to compared the actual value against a critical value found in a Pearson Chi-Square test distribution (where degrees of freedom were calculated as number of rows minus one times the number of columns minus one) and to make a hypothesis conclusion with 95% confidence, the value labeled asymptotic significance (which is the *p* value of the Pearson Chi-Square test statistic) should be less than .05 (which is the alpha level associated with a 95% confidence level). In my analysis, the Pearson Chi-Square test value is 65.776(a), and the *p* value of <.001 with a minimum expected count of 19.80 from the (a) 0 cells (.0%) have expected count of less than 5 computed for two side tables. The *p* value indicates that the variables are not independent of each other, and that there is no statistically significant relationship between the categorical variables. Although the Chi-Square test were significant, but there was no significant association between the independent and dependent variables, I accepted the null hypothesis, and concluded that there was no association between gender, and menthol cigarettes smoking among youth ages 12 to 19. To explain these contradictory results between the bivariate, and regression analysis; I conducted additional Chi-Square tests between all the independent variables used in the regression model. All the predictors were significantly also associated with each other, thus the regression model is not able to explain the dependent

variable, given these specific variables. Recommendations for future research to address this limitation will be provided in detail in section 4.

Table 22

Chi-Square Test Supporting the Findings of Research Question 3

	Value	df	*p* value
Pearson Chi-Square	65.776 (a)	1	.000
Continuity Correction (b)	62.496	1	.000
Likelihood Ratio	83.534	1	.000
Linear-by-Linear Association	65.112	1	.000
N of Valid Cases	99		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 19.80.
b. Computed only for 2x2 table.

Research Question 4

The forth research question was: What is the effect of grade (education level) on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19?

I analyzed data for this research question using cross tabulation (Table 23) and answered the research question using Pearson Chi-Square Text (Table 24). The NYTS 2014, sampled participants ages 12 to 19 from different education level (grade 6 – 12), in comparison between their use of menthol versus nonmenthol cigarettes. The sampling revealed that there was a statistical difference in the use of mentholated cigarettes versus

nonmentholated cigarette based on educational level. From the archive data, there is a significant indication that the association between menthol and participants educational level differs in their use of menthol.

Table 23 is an illustration of how the different grades level were influenced by menthol. Among the 6th grades, 14% were menthol cigarettes smokers, among the 7th grade, 16% were menthol cigarette smokers, among the 8th grade, 15% were menthol cigarettes smokers, among the 9th grade 29% were menthol cigarettes smokers, among the 10th grade 14% were menthol cigarette smokers, and among the 11th grade 12% were menthol cigarette smokers. This revealed that there was a statistical difference in the use of mentholated cigarettes by grade (education level). From the archive data, there is a significant indication that the association between menthol and the five-different grade level differs in their use of menthol. However, when these grade levels were individually compared to the youth smoking preference of mentholated cigarettes versus nonmentholated cigarettes, I found also that an association existed.

Table 23

Crosstabulation

Education Level of Participants Ages 12 to 19 Smoking (Menthol Versus Nonmenthol)

			Smoking (menthol versus nonmenthol smoking) among participants		
			Yes	No	Total
Education level of participants	6th Grade	Count	14	0	14
		% within education level	100.0%	0%	100.0%
		% within smoking (menthol versus nonmenthol smoking) among participants	35.0%	0.0%	14.0%
	7th Grade	Count	16	0	16
		% within education level	100.0%	0%	100.0%
		% within smoking (menthol versus nonmenthol smoking) among participants	40.0%	0.0%	16.0%
	8th Grade	Count	10	5	15
		% within education level	66.7%	33.3%	100.0%
		% within smoking (menthol verses nonmenthol smoking) among participants	25.0%	8.3%	15.0%

(table continues)

			Smoking (menthol versus nonmenthol smoking) among participants		
			Yes	No	Total
	9th Grade	Count	0	29	29
		% within education level	0.0%	100.0%	100.0%
		% within smoking (menthol verses nonmenthol smoking) among participants	0.0%	48.3%	29.0%
	10th Grade	Count	0	14	14
		% within education level	0.0%	100.0%	100.0%
		% within smoking (menthol verses nonmenthol smoking) among participants	0.0%	23.3%	14.0%
	11th Grade	Count	0	12	12
		% within education level	0.0%	100.0%	100.0%
		% within smoking (menthol verses nonmenthol smoking) among participants	0.0%	20.0%	12.0%
Total		Count	40	60	100
		% within education level	40.0%	60.0%	100.0%
		% within smoking (menthol verses nonmenthol smoking) among participants	100.0%	100.0%	100.0%

Hypotheses: There is no association between grade (education level) and menthol cigarette smoking among youth ages 12 to 19

I hypothesized that there is no significant association between grade (education level) and menthol cigarette smoking among youth 12 to 19. In table 24, I compared the actual value against a critical value found in a Pearson Chi-Square Test distribution (where degrees of freedom were calculated as number of rows minus one times the number of columns minus one), and to make a hypothesis conclusion with 95% confidence, the value labeled asymptotic significance (which is the *p* value of the Pearson Chi-Square test statistic) should be less than .05 (which is the alpha level associated with a 95% confidence level). In my analysis, the Pearson Chi-Square test value is 86.111(a), and the *p* value of <.001 with a minimum expected count of 4.80 from the (a) 1 cell (8.3%) have expected count of less than 5 computed for two side tables. The *p* value indicates that the variables are not independent of each other, and that there is no statistically significant relationship between the categorical variables. Although the Chi-Square test were significant, but there was no significant association between the independent and dependent variables, I accepted the null hypothesis, and concluded that there was no association between grade (education level), and menthol cigarettes smoking among youth ages 12 to 19. To explain these contradictory results between the bivariate and regression analysis, I conducted additional Chi-Square tests between all the independent variables used in the regression model. Unfortunately, all the predictors were significantly also associated with each other, thus the regression model is not able to explain the dependent variable, given these specific variables. Recommendations for future research to address this limitation will be provided in detail in section 4.

Table 24

Pearson Chi-Square Tests Supporting the Findings of Research Question 4

	Value	df	*p* value
Pearson Chi-Square	86.111(a)	5	.000
Likelihood Ratio	115.507	5	.000
Linear-by-Linear Association	69.237	1	.000
N of Valid Cases	100		

a. 1 cells (8.3%) have expected count less than 5. The minimum expected count is 4.80

Summary

I analyzed the data from NYTS 2014, collected between 1999 through 2013 using descriptive, and inferential statistics to analyze my study and presented the results, and findings for my doctoral study. I provide a comprehensive description of the bivariate, and multivariate analysis. I provided a cross tabulations for each research question including tables, and figures to illustrate my finding, and results which were illustrated using the Pearson Chi-Square Test. I also provided answers to the research questions using Pearson Chi-Square Test derived from the secondary data retrieved from the NYTS 2014 and accepted my hypothesis.

I reported that the findings from my analysis as illustrated in the study`s *p* value and summarized them in the answers to the individual research questions which indicated that the variables were not independent of each other, and that there was no statistically

significant relationship between the categorical variables. Although the Chi-Square Test were significant, regression analysis revealed that there were no significant association between the independent and dependent variables. To explain these contradictory results between the bivariate, and regression analysis, I conducted additional Chi-Square Tests between all the independent variables used in the regression model. All the predictors were also significantly associated with each other, thus the regression model was not able to explain the dependent variable, given these specific variables. Based on these findings, I accepted the null hypothesis, and concluded that there were no association between my independent variables and my dependent variables. Recommendations for future research to address this limitation will be provided in detail in section 4.

In section 4, I will present a detailed analysis and interpretation of my findings, and an overview of the anticipated social change, and how this study will advance public health in general including this study application to professional practice, and implications for social change. I will also discuss the study limitation, interpretations, and recommendations.

Section 4: Application to Professional Practice and Implications for Social Change

Menthol has been found to be a major contributor to smoking initiation that progresses to regular cigarette smoking and addiction, especially among youths (Hoffman, 2011). Hoffman (2011) stated that the main interest and appeal of menthol cigarettes among youth stems from the belief that adding menthol to cigarettes eradicates the harm associated with smoking; however, various studies have shown otherwise. Mentholated cigarettes are as harmful as the nonmentholated cigarettes (CDC, 2002; Hoffman, 2011). There are strict restrictions on cigarettes sales and a continuous emphasis on the health hazards associated with smoking menthol/nonmenthol cigarettes; however, the effect of this decrease remains intangible because cigarettes mentholated/nonmentholated are one of the major causes of preventable respiratory diseases among America youths, and they are still promoted, marketed, and accessible to youths in the United States (Hoffman, 2011).

Various studies have shown that approximately 4,000 youths experiment with smoking daily, and approximately 1,000 of them become active smokers due to the influence of menthol (CDC, 2002; Hoffman, 2011). It is also well documented that approximately 41,000 youths are exposed to secondhand smoking in the United States yearly, and there are about 440,000 deaths (youths and adults) due to cigarettes (menthol and nonmenthol) smoking combined (CDC, 2002; Hoffman, 2011).

The purpose of this study was to investigate the factors affecting the choice between menthol and nonmenthol cigarette smoking among youths ages 12 to 19 using a

quantitative study design. I used archived survey data gathered from 1999 through 2013 by the NYTS 2014, designed to provide a better understanding of the role of demographic variables, and the factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19. I analyzed the 2014 NYTS dataset using SPSS version 21. I conducted univariate, bivariate and multivariate analysis.

Section 4 includes an interpretation of the findings, a discussion of the limitations of the study, implications for professional practice and social change, positive social change, contribution to public service, and recommendation for further study.

Findings in the Context of Previous Research

Moolchan (2004) studied adolescent menthol smokers and the difficulties in their smoking cessation and discovered that there is a significant association between menthol and smoking behavior. In addition, Ahijevych et al., (2004) studied the application of menthol in cigarettes and concluded that there is an association between menthol and youth smoking behavior due to the addition of menthol to cigarettes. The Centers for Disease Control and Prevention, (2002) study on the effects of smoking at an early age revealed that there is an association between menthol and smoking behavior among youths, and menthol a contributive factor to smoking initiation at an early age. Furthermore, Hoffman, (2011) studied the health effects of menthol cigarettes as compared to nonmenthol cigarettes and found that there is an association between menthol and smoking behavior among youth irrespective of race/ethnicities, sex, and grade. Moreover, Ogden (2010) studied youth smoking addiction and found a link

between menthol and its association with youth smoking addiction. Rising et al., (2011) studied the force behind youth initiation to smoking and discovered menthol to be a force that helps to recruit young smokers while seeking the loyalty of long time smokers. Wickham (2015), also studied nicotine dependence/how menthol altered tobacco smoking behavior and found an association between menthol and youth smoking behavior. All these studies do not corroborate my findings; however, a cross sectional study by Oxford Economics (2012) for Philip Morris International, found no association between menthol and youth smoking behavior and no evidence that the youth smoking increased because of the role menthol plays in smoking behavior. Instead, the study attributed the rise in menthol use among youths to social, institutional, and economic factors which supports the hypothesis of high dependencies, prevalence, preference of menthol, its role in smoking initiation, and behavior among youth 13 to 15 years of age (Oxford Economic, 2012). This study corroborates my findings.

Table 25 summarizes the statistics of participants who smoked menthol and Table 26 summarize the statistics of participants who did not smoke menthol.

Table 25

Statistics of Smoking (Menthol Verses Nonmenthol) Among Participants Ages 12 to 19 (Yes)

		Age of participants	Ethnicity/race of participant	Education level of participants	Gender of participants (boys and girls)
N	Valid	40	40	40	40
	Missing	0	0	0	0

a. Smoking (menthol versus nonmenthol smoking) among participants = yes

Table 26

Statistics of Smoking (Menthol Versus Nonmenthol) Among Participants Ages 12 to 19 (No)

		Age of Participants	Ethnicity/Race of Participant	Education Level of Participants	Gender of Participants (boys and girls)
N	Valid	60	60	60	60
	Missing	0	0	0	0

a. Smoking (menthol versus nonmenthol smoking) among participants = no

The following subsections present findings broken down by variables including age, gender, race/ethnicity, and grade.

Age. Table 27 and table 28 are illustrations of the findings from this study which are consistent with the findings from other existing studies relating to youth smoking behavior by age. For example, using the valid percentage, I found out that 35% of the survey participants smoked menthol when they were 12 years of age, 40% smoked menthol when they were 13 years of age, 25% smoked menthol when they were 14 years of age. However, among the 14 years of age, 10% did not smoke menthol, among the 15 years of age, 26.7% did not smoke menthol, among the 16 years of age, 26.7% did not smoke menthol, among the 17 years of age, 23.3% did not smoke menthol, and among the 18 years of age, 13.3 did not smoke menthol. This finding shows that the prevalence of menthol uses among youth ages 12 to 19 is relatively high. This is aligned with the findings from the study done by Giovino et al., (2013) conducted between 2008 and 2010, the study shows that 56.7% of youth ages 12 to 17 were menthol smokers compared to menthol cigarette prevalence of 35.2% among youth, and adult smokers. To rule out errors, Giovino, et al., (2013) conducted a similar study using a larger sample size between 2004 and 2009. In their findings, 49.9% of middle school students, and 44.1% of high school students that were sampled experimented with mentholated cigarette and they later became active cigarette smokers (Giovino, et al., 2013).

Table 27

Participants Ages 12 to 19 Who Smoked Mentholated Cigarettes (Yes)

		Frequency	Percent	Valid Percent
Valid	12 years of age	14	35.0	35.0
	13 years of age	16	40.0	40.0
	14 years of age	10	25.0	25.0
	Total	40	100.0	100.0

a. Smoking (menthol versus nonmenthol smoking) among participants = yes

Table 28

Participants Ages 12 to 19 Who Smoked Mentholated Cigarettes (No)

		Frequency	Percent	Valid Percent
Valid	14 years of age	6	10.0	10.0
	15 years of age	16	26.7	26.7
	16 years of age	16	26.7	26.7
	17 years of age	14	23.3	23.3
	18 years of age	8	13.3	13.3
	Total	60	100.0	100.0

a. Smoking (menthol versus nonmenthol smoking) among participants = no

Gender. Table 29 and table 30 are illustration of my findings from this study which are consistent with the findings from other existing studies relating to youth smoking behavior by gender. From the analysis, 100% of boys who participated in the survey smoked menthol cigarettes. However, 16.9% boys did not smoke menthol cigarette, and 83.1% of girls who participated in the survey did not smoke menthol cigarettes. From the analysis, I found out that there is a difference in the smoking behavior between male and female, and the influence of menthol on youth smoking behavior is not based on gender. This finding is consistent with the study done by Smith, Akpara, Haq, & Thompson (2017); which found that menthol preference among youths (boys and girls) is stable, and no major differences exist among their preference of mentholated cigarettes.

Table 29

Gender of Participants (Boys and Girls) Ages 12 to 19 who Smoked Mentholated Cigarettes (Yes)

		Frequency	Percent	Valid Percent
Valid	Boys	40	100.0	100.0

a. Smoking (menthol versus nonmenthol) among participants = yes

Table 30

Gender of Participants (Boys and Girls) Ages 12 to 19 Who Smoke Mentholated Cigarettes (No)

		Frequency	Percent	Valid Percent
Valid	Boys	10	16.7	16.9
	Girls	49	81.7	83.1
	Total	59	98.3	100.0
	Missing System	1	1.7	
	Total	60	100.0	

b. Smoking (menthol vs. non-menthol) among participants = no

Race/Ethnicity. Five ethnic groups were represented in this study. Table 31 and table 32 below are illustrations of the findings from this study which are consistent with the findings from other existing studies relating to youth smoking behavior by race/ethnicity. Using the valid percentage, the findings showed that 32.5% of Hispanic who participated in the survey smoked menthol cigarettes, 12.5% of the Asians who participated in the survey smoked menthol cigarettes, 42.5% of the African Americans (Blacks) who participated in the survey smoked menthol cigarettes, and 12.5% of the American Indians who participated in the survey smoked menthol cigarettes. However, 1.7% among the African Americans (Blacks) participants did not smoke menthol cigarettes, and 98.3% of the Whites participants did not smoke menthol cigarettes. I noticed a difference between my findings and the findings of Giovino et al., 2004). In their findings, 68.9% of Blacks smoke menthol cigarette compared to 29.2% Hispanics, and 22.4% White smokers. This

difference could be based on the timing and size of the population sampled. The study by U.S. Department of Health and Human Services (1989) shows that 76% of Blacks preferred menthol cigarette compared to 23% White smokers, while Muilenburg & Legge (2008) found that 70% of Blacks "African Americans" preferred menthol compared to 30% White Americans. Ahijevyeh et al., (2004), studied racial and ethnical differences in the preference of mentholated cigarettes, the association between menthol and cigarette addiction, the role of menthol in smoking initiation, and the pharmacological components of menthol including their effects on young smokers. The result of their study showed that mentholated cigarettes initiates new smokers from different ethnicities. Furthermore, the study by Giovino et al., (2004) provided a statistical analysis of the influence of menthol in youth smoking initiation based on ethnicity, gender and the racial gap in menthol use.

Table 31

Ethnicity/Race of Participants Ages 12 to 19 Who Smoked Mentholated Cigarettes (Yes)

		Frequency	Percent	Valid Percent
Valid	Hispanics	13	32.5	32.5
	American Indians	5	12.5	12.5
	Asians	5	12.5	12.5
	Blacks (African American)	17	42.5	42.5
	Total	40	100.0	100.0

a. Smoking (menthol versus nonmenthol) among participants = yes

Table 32

Ethnicity/Race of Participants Ages 12 to 19 Who Smoked Mentholated Cigarettes (No)

		Frequency	Percent	Valid Percent
Valid	Blacks (African American)	1	1.7	1.7
	Whites	59	98.3	98.3
	Total	60	100.0	100.0

a. Smoking (menthol versus nonmenthol) among participants = no

Grade. Table 33 and table 34 are illustrations of the findings from this study which are consistent with the findings from other existing studies relating to youth smoking behavior by grade (education level). In this study, the educational level of participants was analyzed. The grade of participants during the time of the survey was between 6 to 12 grades from the participating middle and high school. In my findings, using the valid percentage, 35% of the 6th grades who participated in the survey smoked menthol cigarettes, 40% of the 7th grades who participated in the survey smoked menthol cigarettes, and 25% of the 8th grades who participated in the survey smoked menthol cigarettes. However, 8.3% of the 8th grades who participated in the survey did not smoke menthol cigarettes, 48.3% of the 9th grades who participated in the survey did not smoke menthol cigarettes, 23.3% of the 10th grades who participated in the survey did not smoke menthol cigarettes and 20% of the 11th grades who participated in the survey did not smoke menthol cigarettes. The survey shows that the percentage of the

participants were significantly close. The original data collectors believed that the reason for this close similarity in the initiation rate was because of continuous smoking advertisement that targets this population irrespective of age (CDC, 2014a).

Table 33

Grade (Education Level) of Participants Ages 12 to 19 Who Smoked Menthol Cigarettes (Yes)

		Frequency	Percent	Valid Percent
Valid	6th Grade	14	35.0	35.0
	7th Grade	16	40.0	40.0
	8th Grade	10	25.0	25.0
	Total	40	100.0	100.0

a. Smoking (menthol versus nonmenthol) among participants = yes

Table 34

Grade (Education Level) of Participants Ages 12 to 19 Who Smoked Menthol Cigarettes (No)

		Frequency	Percent	Valid Percent
Valid	8th Grade	5	8.3	8.3
	9th Grade	29	48.3	48.3
	10th Grade	14	23.3	23.3
	11th Grade	12	20.0	20.0
	Total	60	100.0	100.0

a. Smoking (menthol versus nonmenthol) among participants = no

Findings in the Context of the Theoretical/Conceptual Framework

One of the theories that adequately addresses human decision making relating to changes in human behavior is the Fishbein and Ajzen`s (1980) TPB. The role of the TPB in this study is to provide a clearer understanding of smoking behavior among youth 12 to 19. I found no significant association between menthol cigarettes use among participants ages 12 to 19 and the variables investigated (age, race/ethnicity, grade, and gender). This finding supports the context of the TPB that smoking is a behavior and a decision supported by conscious willingness that is encouraged or influenced by several internal and external variables such as age, race/ethnicity, gender, and grade. From this study, a correlation between the constructs of TPB, and the study`s findings exist. For

example, smoking and the preference between menthol vs. nonmenthol cigarette are choices supported by intent, deliberate act and planning which are key components of TPB (University of Twente, 2010). This intention is influenced by three considerations: Behavioral belief (likely consequences of behavior); Normative belief: (the normative expectation of others); and the Control belief: (factors that could interfere with the performance of a specific behavior), and based on six constructs: Attitude, Behavioral Intention, Subjective Norm, Social Norms, Perceived Power, and Perceived Behavioral Control (University of Twente, 2010). These constructs, and how they relate to this study are discussed.

Attitude. Attitude represents the degree an individual considers or evaluate a behavior of interest to be either favorable or unfavorable. The TPB works by predicting that a positive attitude towards an act of a behavior is one of the best predictors for forming a behavioral intention that in-turn lead to a display behavior or act. A survey was conducted by NYTS 2014 to determine participant`s attitude towards smoking. One of the aims of the study was to determine participant`s concerns on the harm associated with smoking. From the survey, 32.2% strongly believed that smoking is dangerous. More studies will be needed to further understand the different attitude of youths concerning their smoking related behavior.

Behavioral Intention. The survey by NYTS 2014 shows participants` behavior concerning smoking. Behavioral intention represents any motivational factors that could influence a given behavior and behavior is performed based on how strong the intention is to perform that behavior (LaMorte, 2016). The TPB emphases behavior as deliberative

and planned while acknowledging intention as predictor of the same behavior (Ajzen, 2006, 1991; University of Twente, 2010). The role of intention supports the fact that people make conscious decisions to adopt a behavior, and it is the immediate antecedent of that same behavior (Ajzen, 1991; University of Twente, 2010). Among the participants surveyed, behavior played a major role in the smoking initiation, with little or no regard for the consequences of the intended behavior. For example, only 29.4% of the people sampled believed that smokers harm themselves when they smoke.

Subjective Norm. Subjective norm is a person`s beliefs about whether his or her significant others (friends and families) think he or she should engage in a certain behavior. It relates to a person's perception of how the social environment will influence an intended behavior (LaMorte, 2016). For example, if a person sees an item, likes the item, believes that other people like the same item, and that he or she can afford that item then the possibility of getting the item is high. On the other hand, if one or more of the construct is unfavorable, for example, if the person sees the item, and does not like the item, believes others will not like the item and probably cannot afford it, then the likely hood of buying the item is small (Ajzen, 2006, 1991). From the study, 54.2% were influenced to smoke because they lived with a smoker or someone very close to them is a smoker.

Social Norm. Social norms, either normative or standard, represent the customary codes of behavior in a group of people or larger cultural context (LaMorte, 2016). These norms are helpful in creating the foundation needed to correct a behavior. Many youths are willing to correct their smoking behavior if an effective moral and social support are

present. The NYTS study shows the different behaviors of participants towards smoking using their response to the questionnaires. For example, when asked about their willingness to quit smoking when there is a moral/social support to support their decision, 13.6% will be willing to quit smoking within the next 30 days. Youths develop more resistive attitude towards quitting smoking when there are no moral/social support system that they will depend on, and when their role model are at liberty to promote and engage in smoking behavior while they are under massive pressure to stop smoking.

Perceived Power. Perceived power is existence of perceived factors capable of facilitating or impeding the performance of a behavior (LaMorte, 2016). Despite the pressure from both internal and external factors, youths have the power to make the final smoking decision. Their individualized intention to smoke will influence the rate of their smoking initiation. Although young, yet youths are capable to understand the health hazard associated with smoking. From the survey, 35.4% of the participants were never concerned about the health hazard associated with smoking.

Perceived Behavioral Control. Perceived behavioral control is an individual analysis of the challenges involved in performing any behavior of interest (LaMorte, 2016). These behavior or interest can become addictive when not addressed and corrected in a timely manner. This construct collectively explains how individuals exercise control over their behavior according to the TPB. From the sampled population`s view on the addictiveness of mentholated cigarettes, 22.0% do not know if mentholated cigarette smoking is addictive because of the limited information they have about the addictiveness of smoking, and cigarettes at the time of the survey.

Summary of Key Findings and Interpretation

In reviewing the smoking behavior among youth ages 12 to 19, using the NYTS 2014 dataset, I answered four main research questions: (a) What is the effect of age on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19? (b) What is the effect of ethnicity/race on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19? (c) What is the effect of gender on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19? (d) What is the effect of grades (education level) on type of smoking (menthol versus nonmenthol smoking) in youths ages 12 to 19? Through my analysis of data, I found no significant association between menthol cigarettes use among participants ages 12 to 19, and the variables investigated (age, race/ethnicity, grade, and gender)

The study utilized responses to returned questionnaires by participants, drafted by the NYTS to find out both collectively and individually participants` concerns, and view on smoking including the choice of menthol versus nonmenthol cigarettes. In this study, internal and external factors played a major role in participants` smoking initiation, and in the choice between menthol versus nonmenthol cigarette. From the survey, 54.2% said that they were influenced to smoke because they lived with a smoker or someone very close to them is a smoker, and 2.3% said they were sometimes influenced to smoke because they lived with a smoker or someone very lose to them is a smoker. Similarly, 10.2% of participants believed mentholated cigarette smoking is less addictive, 18.6% believed they are equally addictive, 3.4% believed they are more addictive, 2.3% were not sure and 22.0% do not know if mentholated cigarette smoking is addictive because of

the limited information they have about the addictiveness of smoking and cigarettes at the time of the survey. In addition, 32.2% strongly believed that smoking is dangerous, 19.2% believed smoking is dangerous, 4.0% of the participants disagreed but not strongly that smoking is not dangerous, while 2.3% strongly disagreed that smoking is very dangerous.

Furthermore, from the surveyed participants, 35.4% were not concerned about the harmful chemicals in mentholated cigarettes, 13.6% stated they were rarely concerned, 10.7% were sometimes concerned, 4.0% were often concerned and 3.4% were never concerned. Concerning misleading, and unclear warning labels of the harm associated with smoking in general, 9.6% were never concerned about not seeing the warning label on mentholated cigarette packages; 12.4% were rarely concerned, 11.9% were sometimes concerned, 7.9% were most of the times concerned, 14.7% were always concerned.

I discovered that majority of the participants agreed that smoking; menthol or nonmenthol is unhealthy. I found out that only 13.6% were willing to quit smoking within the next 30 days, 6.2% will quit smoking within the next 6 months, 4.5% will quit smoking within the next 12 months, 9.6% will quit smoking but not within the next 12 months, and 22.6% do not intend to quit smoking; menthol or non-menthol cigarettes. Furthermore, I found out that 1.7% believed smokers do not harm themselves when they smoke mentholated cigarettes, 4.5% believed smokers harm themselves a little when they smoke, 20.9% believed that smokers harm themselves slightly when they smoke, and 29.4% believed that smokers harm themselves a lot when they smoke.

Research Question 1.

I found out that there is no significant association between age and menthol cigarette smoking among youth 12 to 19. I compared the actual value against a critical value found in a Pearson Chi Square Test distribution and to make a hypothesis conclusion with 95% confidence that the value labeled asymptotic significance should be less than .05, the alpha level associated with a 95% confidence level. In my analysis, the Pearson Chi Square Test value is 84.375 (a), and the *p* value of <.001 with a minimum expected count of 3.20 from the (a) 2 cells (14.3%) have an expected count of less than 5 computed for two side tables. The *p* value indicates that the variables are not independent of each other, and that there is statistically significant relationship between the categorical variables. Although the Chi-Square Test was significant, regression analysis demonstrated that there was no significant association between the independent and dependent variables; thus, I accepted the null hypothesis, and concluded that there was no association between age, and menthol cigarettes smoking among youth ages 12 to 19.

Research Question 2.

I discovered that there is no significant association between ethnicity/race, and menthol cigarette smoking among youth 12 to 19. I compared the actual value against a critical value found in a Pearson Chi Square Test distribution, and to make a hypothesis conclusion with 95% confidence; the value labeled asymptotic significance should be less than .05, the alpha level associated with a 95% confidence level. In my analysis, the Pearson Chi Square Test value is 96.065 (a), and the *p* value of <.001 with a minimum expected count of 2.00 from the (a) 4 cells (40.0%) have an expected count of less than 5

computed for two side tables. The *p* value indicates that the variables are not independent of each other and that there is no statistically significant relationship between the categorical variables. Although the Chi-Square test was significant, regression analysis demonstrated that there was no significant association between the independent and dependent variables; thus, I accepted the null hypothesis and concluded that there was no association between race/ethnicity, and menthol cigarettes smoking among youth ages 12 to 19.

Research Question 3.

I discovered that there is no significant association between gender and menthol cigarette smoking among youth 12 to 19. I compared the actual value against a critical value found in a Pearson Chi Square Test distribution, and to make a hypothesis conclusion with 95% confidence; the value labeled asymptotic significance should be less than .05, the alpha level associated with a 95% confidence level. In my analysis, the Pearson Chi Square Test value is 65.776(a), and the *p* value of <.001 with a minimum expected count of 19.80 from the (a) 0 cells (.0%) have an expected count of less than 5 computed for two side tables. The *p* value indicates that the variables are not independent of each other, and that there is no statistically significant relationship between the categorical variables. Although the Chi-Square test were significant, but there was no significant association between the independent, and dependent variables; thus, I accepted the null hypothesis, and concluded that there was no association between gender and menthol cigarettes smoking among youth ages 12 to 19.

Research Question 4

I found out that there is no significant association between grade (education level) and menthol cigarette smoking among youth 12 to 19. I compared the actual value against a critical value found in a Pearson Chi Square Test distribution, and to make a hypothesis conclusion with 95% confidence, the value labeled asymptotic significance should be less than .05, the alpha level associated with a 95% confidence level. In my analysis, the Pearson Chi Square Test value is 86.111(a), and the *p* value of <.001 with a minimum expected count of 4.80 from the (a) 1 cell (8.3%) have an expected count of less than 5 computed for two side tables. The *p* value indicates that the variables are not independent of each other and that there is no statistically significant relationship between the categorical variables. Although the Chi-Square test were significant, but there was no significant association between the independent, and dependent variables; thus, I accepted the null hypothesis, and concluded that there was no association between grade (education level) and menthol cigarettes smoking among youth ages 12 to 19.

Findings from this study will help in the development of interventions to prevent menthol, and regular cigarette smoking that resulted in the decrease in morbidity and mortality among persons who initiated smoking at an early age. In addition, a link between menthol, and youth smoking behavior was established by analyzing the NYTS 2014 data for tobacco-related indicators for both middle school (Grades 6–8), and high school (Grades 9–12) students which provided a national estimate of 95% confidence level with a margin of error of 5% (Office on Smoking and Health, 2014). This is consistent with the purpose of the study which focused on investigating the factors

associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19 using a quantitative study design.

Limitations of the Study

Limitations with the NYTS 2014 dataset had an impact on the validity and reliability of this study`s findings. To address these limitations, I reviewed and compared data from previous NYTS conducted from 1999 to 2013 to find out if the study limitations were limited to the 2014 study. I found out that similar limitations exist in previous surveys which shows a preferred method of data collection by the original data collectors. Moreover, I conducted a secondary analysis of the data, and I was therefore removed from the original intent of the survey and study; however, because I used a reputable data source, I have confidence in the rigor of the original data collection, and current data maintenance protocols assured by CDC. The NYTS were limited to youths ages 12 to 19, and limited ethnicities.

Recommendation for Further Research

At all levels, this study adds to the already existing information used in the training of local/community, state, and national public health associates on how to effectively educate youths on the hazard associated with smoking without labeling smokers as bad people. In addition, I suggest that since findings of this study shows some inconsistencies between the bivariate and regression analysis, which is common in most research studies, I recommend further studies to understand why bivariate and regression analysis could be inconsistent in any study. I also recommend further studies

on the variable with larger sample size which would increase the study power. A greater study power will decrease the chances of a type 2 error and make the outcome of the study more reliable. This may be supported by manipulating the independent variable which are variables that do not depend on or are influenced by the dependent variables, and in most cases are manipulated by the researcher to understand how the changes in the independent variables may affect or influence the outcome of the study.

Furthermore, it was impossible to explore the reasons behind youth smoking behavior during this study, except the addictive properties of tobacco products which serves as a stimulant to smoking, and the dataset limits my ability to explore how long youths intend smoke, and to what extent their decision to smoke was attributed to peer pressure, depression, social economic factors, and other factors. Based on these, I strongly suggest that more studies be done on the intent behind youth smoking behavior, and a comprehensive study to explore the reason behind youth smoking behavior. Furthermore, this study was not intended to explore the adverse health outcomes associated with short and long-term smoking among youth who smoke menthol cigarettes compared to those who smoke regular or nonmenthol cigarette. I suggest that a quantitative study be done to address these issues, and to find out to what extent mentholated cigarette is responsible for the high smoking initiation rate among youth smokers.

Very little is known about what factors might be associated with the youth who smoke menthol cigarettes, either for experimentation or as their permanent choice of tobacco use. However, it is believed that some people delight in fighting, and resisting

any restraint to their freedom. I suggest incorporating the theory of psychological reactance. The theory of psychological reactance states that people tend to do what they are continuously asked not to do by fighting back, and resisting any restriction on their freedom (Dewey, 2011). Brehm (1966), describe psychological reactance as a rising force against someone`s intention, and freedom, and how people may push back when their freedom is continuously attacked. The theory of psychological reactance will enable healthcare professionals, and youth smoking cessation advocates to tread with caution in promoting smoking abstinence/cessation among youths. The CDC reported that there are new evidences of the gradual rise in the use of cigarettes among adolescents. Based on this, I support Hoffman (20011) view that evidence-based smoking related programs should be incorporated in school`s curriculum.

Finally, to discourage teen smoking, preventing early smoking or early experimental smoking among youth is critical (CDC, n.d.). I suggest a collaborative method between local, state and federal leaders including representatives of tobacco companies in developing some effective youth smoking prevention interventions, strategies such as smoking preventive measures, challenges, influence of peers in schools, health education, and moral/social supports for youths whose parents are smokers. I also suggest that communities should continue to call on tobacco companies to limit or eradicate cigarette advertisement in open places near kids` play grounds, and community centers. I also suggest that ineffective strategies such as cigarettes price hike should be revisited. For example, increasing the price of cigarettes, and prohibiting the sales of

cigarette to minors have not effectively reduced smoking initiation (CDC, n.d.; Richardson et al., 2015).

Implications for Professional Practice and Social Change

Professional Practice.

This study may help public health practitioners to adequately address the public of the effect of smoking initiation especially among American youths. It may also create a positive solution to the influence of menthol by reducing the initiation rate of young American smokers due to widely advertised mentholated cigarette. This study can be used as a guide by public health professionals and those in policy development who work with youths in education and prevention, in improving their practice, and in developing an evidence base initiative tailored towards a gradual reduction of cigarette (menthol or nonmenthol) smoking among youths.

Methodological. This study involves a detailed description of the study setting, research design, study sample, data collection, method, procedures, and analysis efforts. The nature of this study was based on quantitative research consistent with understanding the factors associated with the choice of mentholated cigarette smoking compared to nonmentholated cigarette smoking among youths ages 12 to 19 using a quantitative study design. From this archived data study, analytical techniques were used to answer the research questions using SPSS. I tested and examined any association that existed among applied variables in this study, and a quantitative study was employed to provide more understanding of the original data (Creswell, 2009), and how it related and provided more insight to menthol, and youth smoking behavior.

Theoretical. Most theoretical models focus on social and human behavior. I am suggesting the integration of theories and models to help understand youth smoking behavior framework. In this study, the TPB was used to test, and to find out to what extent, the relationship of these variables has on youths smoking behavior; secondly, to find out if these variables contributed to their choice of mentholated cigarettes over nonmentholated cigarettes based on the 2014 NYTS dataset. The constructs emphasized by the TPB was important to this study and serves as independent predictors on youth smoking behavior using the data from NYTS, 2014

Empirical. Youth smoking behavior is a public health challenge that has not attracted enough attention compared to the consequences of their smoking behavior. It is a universal assumption that adequate policies designed to reduce youth smoking behavior/initiation will reduce smoking propensities; however, this assumption has not been empirically tested (Glied, 2002). I used data from the NYTS 2014 to follow smoking pattern of youth ages 12 to 19 and I examined how smoking rate in youth were affected by various variables. I found out that the effect of these variables did not affect youth smoking behavior; however, some evidence supports a consequence of smoking initiation that is correlated with youth smoking behavior.

Positive and Social Change

The potential positive change impact of this study is a better understanding of youth smoking behavior and the development of prevention intervention to protect the health of this vulnerable population. The potential social change impact of this study is a

better understanding of the role of demographic variables and menthol cigarette smoking that may help to prevent smoking related morbidity and mortality among youth.

Individual. The decision to smoke is individualized although influenced by both internal and external factors. At the individual level, this study generated information that shows that youth have significant parts to play towards their complete cessation of smoking behavior. These findings can enable youth to understand that irrespective of their age, they are responsible for their behavior, the choices they make, and the action they take. It will empower youth to seek help, and moral support in their quest to achieve a tobacco free live style. This support Erikson (Psychosocial), study of youth identity formation and individual struggle between achieving identity and identity diffusion, and Piaget (Cognitive) study of youth`s operational thought and actual experiences, and their ability to think in logical and abstract terms (Rice et al., 2002).

Family. Youth learn by observation and modeling, and families serves as role model, and the primary influence on youths. At the family level, this study possesses enough information on the vital role of family in encouraging youth smoking abstinence. Families have unlimited influence on a child life and are the first, and most effective educators in directing a child lives' style. However, youths find it upsetting for their smoking behavior to be considered unhealthy, and an unjust act packed with restriction when the same smoking behavior is performed by their parents in their presence, with no scrutiny attached. Bronfenbrenner (Ecological) study of the context in which adolescents develop, and how they are influenced by both internal and external factors such as family,

peers, religion, schools, the media, community, and world events show that youths are surrounded by factors capable of influencing their decision, and behavior.

Organizational. The youths are part of a complex organization structure that consist of family, peer, religious, social leaders, and school leadership, including the power of social media. These organizational structure is capable of directly or indirectly influencing youth behavior, and their decision-making process. This study provides adequate information and serves as a tool to those directly involves with the youths, helping youths abstain from smoking, and encourage those youth smokers to quit smoking. This supports Bandura (Social Cognitive Learning) study that relationship between social and environmental factors constantly influences youth`s behavior because they mainly learn through modeling.

Societal/Policy. The saying that "it takes a village to raise a child", have been referenced in various studies pertaining to youth`s behavior. The society is a powerful force in shaping the live style of youths. Studies shows that youths spend most of their youthful age in their different communities, and at the community level, the findings of this study address the urgent need for both community leaders, religious leaders, school, law enforcement agencies, and other prominent community members/private citizens to team up in embracing a smoke free society. When this is achieved, childhood morbidity and mortality due to smoking related illnesses will be reduced, resulting in better health indices, and health outcomes. In addition, the findings of this study will assist in policy development, and review of failed policies to ensure that policies, and decision concerning youth smoking behavior and initiation are evidence based. This study support

Mead and Gilligan (Cultural) study that the factors in the culture in which youth grows up will either improve the positives outcome or reduce the negative outcome which will result in more effective and efficient programs aimed at reducing youth smoking initiation and behavior in the United State of America. This study and its findings can therefore, positively influence policy development, program implementation, monitoring and evaluation of programs as well as eventual health outcomes in the United State.

Conclusion

The high smoking initiation rate among American youths is unacceptable and a chronic public health challenge that need continuous attention by the United States government and public health professionals. Ever since menthol was added to cigarettes, smoking initiation rate among youths has tripled. The purpose of menthol; a cooling substance with a peppermint odor, is to make smoking more comfortable by reducing the harshness associated with smoking. Unfortunately, menthol has enhanced the taste of cigarettes, made smoking more appealing, and smoking initiation rate among youths tripled leading the initiation of millions new smokers.

The addition of menthol to cigarettes is making smoking more accommodative and acceptable by many youths. Smoking is unhealthy, and convincing youths on the danger associated with smoking, menthol/nonmenthol cigarettes remain a complex challenge. Youths are still smoking at a higher rate, and the rate of smoking initiation among youths remain very high even with various interventions from public health professional. From this study`s findings, the bivariate analysis was significant for each of the variables even though the regression analysis was not significant; so larger studies

with more power should be conducted. This study`s predictors provided better understanding why majority of youths believe that smoking (mentholated cigarettes) is fulfilling and contributes to acceptance among their peers. Although the choice to smoke is individualized, this study confirm that majority of youths will probably not become smokers without internal and external influence. This study also confirm that smoking cessation is less difficult if there are enough social and moral support however, the longer youth smoke, the more it becomes difficult for them to quit despite being well informed of the health hazard associated with smoking.

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