Colorectal Cancer Disease in Appalachia: Symptom Interpretation and Cancer Worry Predictors

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Tobacco Use, Number of Serious Smoking Cessation Attempts, and Interest in Lung Screening in a Sample of Adult Muslims in the United States

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Dissertation submitted
to the School of Pharmacy
at West Virginia University

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ABSTRACT

Tobacco Use, Number of Serious Smoking Cessation Attempts, and Interest in Lung Screening in a Sample of Adult Muslims in the United States

Omar F. S. Attarabeen

Muslims in the United States (US) exhibit higher rates of tobacco use in comparison with rest of the US population. As a result, US Muslims might be at a higher risk for negative health consequences of tobacco use such as lung cancer. Investigating factors that are associated with tobacco use, number of smoking cessation attempts, and interest in lung screening in adult US Muslims can facilitate future efforts aimed at improving health outcomes, essentially through reducing tobacco use rates and promoting preventive lung screening in this population. Therefore, the current dissertation aimed to investigate the association of Social Cognitive Theory factors with 1) tobacco use, 2) number of serious smoking cessation attempts, and 3) interest in lung screening in a sample of adult Muslims in the US.

Data were collected from November 2016 through March 2017 from a convenience sample of adult (≥ 18 years) US Muslims. The study included a cross-sectional online survey. Participants with a personal history of lung cancer were excluded. Associations between Social Cognitive Theory factors and tobacco use, number of serious smoking cessation attempts as well as interest in lung screening were investigated with univariate analyses followed by regression analyses.

For aim 1, eligible participants (n=271) from 30 states completed the survey; 52.8% reported current tobacco use. In terms of personal factors, individuals were less likely to report current tobacco use if they 1) perceived more personal consequences for tobacco use on health, and 2) reported greater confidence regarding ability to abstain from tobacco use. In terms of environmental factors, individuals whose family members did not use tobacco were less likely to report current tobacco use. Interaction between sex and attitudes indicated that among individuals with negative views about tobacco use, women were less likely to report current use compared to men.

For aim 2, eligible participants (n=132) from 23 states completed the survey; 47.0% seriously attempted to quit smoking at least once over the past 12 months, half of which reported attempting to quit without any assistance. Smokers reported more serious smoking cessation attempts if they 1) had more knowledge about the consequences of smoking cessation, 2) had more positive attitude regarding quitting, and 3) reported greater religiosity. Additionally, smokers reported fewer serious smoking cessation attempts if they 1) were employed, 2) affiliated with Sunnah sect, 3) reported better self-assessed health, 4) reported higher perceived value for quitting, and 5) indicated that using tobacco was not allowed inside the home.

For aim 3, eligible participants (n=271) from 30 states completed the survey; 59.9% expressed an interest in being screened for lung cancer. Individuals were more likely to express an interest in lung cancer screening if they had 1) more positive views about lung screening, 2) higher perceived value of screening, and 3) greater self-efficacy with regard to ability to undergo lung screening.
Personal views and confidence in one’s ability to take an action can be essential factors in tobacco use-related behavior and interest in lung screening among US Muslims. Additionally, religiosity can play an influential role in promoting tobacco cessation in US Muslim smokers. Overall, this dissertation can be a seminal work for future interventions aimed at reducing tobacco use and its health burden, especially lung cancer, in this unique segment of the US population.
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Chapter 1

Introduction

Background

Over 1.1 billion individuals use tobacco products globally,\textsuperscript{1,2} and 50\% are expected to die prematurely from its use.\textsuperscript{3,4} Tobacco use is the leading cause of preventable death and illness nationally and globally.\textsuperscript{5,6} In the United States (US), tobacco use is associated with more than 480,000 premature deaths annually;\textsuperscript{7} that is 1 in every 5 deaths in the US.\textsuperscript{5} This makes tobacco use the leading cause of preventable death in the US.\textsuperscript{5} Efforts to curb cigarette smoking have been partially successful in the US as the number of former smokers has now exceeded the number of current smokers.\textsuperscript{5} However, the use of other tobacco products, such as e-cigarettes, cigars, and water-pipes (also known as hookahs or shishas) has been increasing.\textsuperscript{8-10} In sum, tobacco use continues to be a major cause of premature death and preventable illness in the US.

Tobacco use causes several life threatening cardiovascular and respiratory diseases,\textsuperscript{5,11-21} which substantially reduce life expectancy and health related quality of life.\textsuperscript{22} For example, tobacco is associated with chronic obstructive pulmonary disease,\textsuperscript{23} asthma,\textsuperscript{24} stroke,\textsuperscript{25} cardiovascular disease,\textsuperscript{26} autoimmune disorders,\textsuperscript{27} cancer,\textsuperscript{28} and other diseases.\textsuperscript{5} In particular, lung cancer is a major negative health consequence of tobacco use.\textsuperscript{5,29} According to the American Cancer Society, 222,500 newly diagnosed cases and 155,870 deaths will be attributed to lung cancer in 2017.\textsuperscript{30} This makes lung cancer the second most commonly diagnosed cancer and the leading cause of cancer-related death in the US.\textsuperscript{31} Compared with those who never smoked, current smokers are 25 times as likely to die due to lung cancer.\textsuperscript{29} Therefore, tobacco use continues to be a significant health problem in the US. This is especially true among certain
minorities, which exhibit elevated rates of tobacco use, such as Muslims.\textsuperscript{32,33} Therefore, US Muslims might be subject to negative health consequences due to higher rates of tobacco use compared to the rest of the US population.\textsuperscript{32,33}

Quitting smoking is associated with major health benefits and gradual recuperation of health.\textsuperscript{34-37} For example, quitting smoking is likely to be associated with improved respiratory function, decreased chances of developing cancer (especially lung cancer),\textsuperscript{34,38,39} and reduced incidence of cardiovascular diseases.\textsuperscript{34,37,39,40} The chances and extent of health betterment are dependent on smoking history (e.g., duration, intensity), age when quitting smoking, sex, time span after smoking cessation, and other factors.\textsuperscript{41} However, quitting smoking is associated with temporary physical and mental changes, known as withdrawal symptoms, such as depression, irritability or impatience, impaired concentration, restlessness, fatigue or lack of energy, weight gain/fear of weight gain, drowsiness, and headache.\textsuperscript{42-46} The fear of having these symptoms may reduce smokers’ confidence about their ability to quit smoking, and therefore, discourage them from attempting to quit smoking.\textsuperscript{47} In sum, quitting smoking is associated with some withdrawal symptoms that are outweighed by the important, but gradual, improvement in health status and reduced morbidity and mortality associated with not smoking.

The readiness to quit smoking and the prevalence of tobacco use are variable depending on certain demographic factors.\textsuperscript{48-51} For example, rates of tobacco use are elevated among Muslims globally.\textsuperscript{52} and in the US.\textsuperscript{32,33} The Muslim population, with its high fertility rate and increased immigration, is one of the fastest growing populations in the US.\textsuperscript{53} In sum, US Muslims’ health-related behavior related to tobacco use is becoming more salient and may influence the health of the general population of the US at an increasing rate.
The Muslim population in the US ranges between three to seven million people.\textsuperscript{54-56} During the last few decades, immigration from predominantly-Muslim countries to the US has increased due to political instability in source countries\textsuperscript{57} as well as the Immigration and Nationality Act of 1965,\textsuperscript{58} which terminated the quota system, allowing the number of Muslim immigrants to increase.\textsuperscript{59} However, recent political changes in 2017 in the US have brought certain restrictions on immigration from several Muslim majority countries.\textsuperscript{60} Even though some of these restrictions were overturned by the judicial branch, the impact of these changes on the Muslim population in the US is not yet understood.

The majority (63\%) of Muslims in the US are foreign-born.\textsuperscript{61} Thus, the prevalence of tobacco use among them may be highly correlated with prevalence in their countries of origin. Although the smoking rate in the US has declined over the past few years, smoking rates are growing in other parts of the world, such as predominantly Muslim countries.\textsuperscript{3,11,52,62} Further, if tobacco use is highly prevalent in their source countries, individuals who immigrate to the US might be more likely to be tobacco users, which may exacerbate the tobacco epidemic in the US. For example, 119,427 Pakistani immigrants have arrived in the US between 2000 and 2010\textsuperscript{63} from a country where 6.4\% of women and 44.6\% of men use tobacco.\textsuperscript{64} In a sample of adult New York Muslims, low rates (13\%) of cigarette smoking was associated with high rates of using other tobacco products. For example, 22\% of them use water-pipes, whereas 3\% chew tobacco products such as pan or gutka.\textsuperscript{33} It is noteworthy that nearly two-thirds (68\%) of that NY Muslim sample was foreign-born. In conclusion, general rates of tobacco use are elevated among Muslim communities globally\textsuperscript{52} and in the US.\textsuperscript{32,33} Despite the elevated rates of tobacco use among US Muslims,\textsuperscript{32,33} only few research studies examined the association between cognitive and environmental factors and tobacco use, number of serious smoking cessation attempts, as
well as interest in lung screening in adult US Muslims. These and other relevant studies are listed below under heading: “Factors that Influence the Outcomes of Interest”. However, few studies have utilized a comprehensive theoretical framework such as Social Cognitive Theory (SCT) to investigate the association between the above-mentioned outcomes of interest and cognitive as well as environmental factors, particularly in the US Muslim population.

**Types of Tobacco Products**

Tobacco products are available in several forms, flavors, and commercial products. These products are available with varying degrees of nicotine content, geographical distribution, and health effects. The most common type is cigarettes, which is composed from shredded and dried tobacco leaves that are rolled into cylinders. Water-pipes are another form of smoked tobacco that is common in Middle East and South Asia. When using a water-pipe, smoke is inhaled from a hose after it passes through a water chamber. Therefore, some smokers mistakenly think that harmful ingredients are filtered out. However, it is estimated that every session of using a water-pipe (20-80 minutes) is equivalent to smoking at least 100 cigarettes.

Bidis and Kreteks are types of smoked tobacco that are common in South and Southeast Asian countries. They usually come with different flavors such as chocolate, cherry, or cloves. Cigars, Cigarillos, and Little Cigars are composed from fermented tobacco. They are often made without filters in order for smokers to have the full taste and smell associated with the flavor. Available data (2000 – 2011) indicates that cigar use in the US more than doubled and that currently 7.3% of U.S. adults smoke cigars.

Electronic cigarettes (e-cigarettes) are nicotine delivery systems. Refillable – or replaceable – cartridges deliver a controlled amount of flavored nicotine. E-cigarettes were
advertised as a “green” alternative to cigarettes.\textsuperscript{76} However, the US Food and Drug Administration (FDA) has found that e-cigarettes contain many toxic and carcinogenic materials.\textsuperscript{77} Finally, Snus and Ghutka are smokeless tobacco products. They are available as dry or moist products that are shredded or finely ground. They can be chewed, inhaled into the nose, or placed to dissolve inside the cheek.

\textbf{Definitions and Health Care Recommendations}

Tobacco use falls into three categories: 1) never users, 2) former users, and 3) current users. According to the National Center for Health Statistics,\textsuperscript{78} a “never smoker” is an individual who either never smoked or who smoked less than 100 cigarettes in their lifetime. A “former smoker” is an individual who smoked at least 100 cigarettes in their lifetime but who had quit smoking. A “current smoker” is an individual who has smoked 100 cigarettes in their lifetime and who currently smokes cigarettes. With regard to other forms of tobacco, “never user” is an individual who has never used any tobacco products. A “former user” is an individual who has used a tobacco product in the past, but not during the past 30 days. Finally, a “current tobacco user” is an individual who used tobacco products anytime over the past 30 days.\textsuperscript{79,5}

The US Preventive Services Task Force (USPSTF) and the Community Preventive Services Task Force (CPSTF) recommend that health care providers and clinicians encourage current tobacco users to quit, assess their readiness to quit, provide assistance (e.g., pharmacotherapy and behavioral counseling), and arrange for follow-up and future support.\textsuperscript{80,81} Additionally, the USPSTF recommends annual lung screening among some current smokers and former smokers in order to help lessen some of the consequences of tobacco use.\textsuperscript{82} Lung screening can reduce mortality associated with lung disease.\textsuperscript{83} Tobacco users may be eligible for lung screening based on their tobacco use history, age, health status, and other logistical
factors.82 Finally, tobacco use and pursuit of lung cancer may associate with certain cognitive, environmental, and demographic factors. An overview of factors that have been identified in the literature are introduced in the sections below.

**Factors that Influence the Outcomes of Interest**

*Tobacco Use.* Certain demographic, cognitive, and environmental factors may influence individuals’ decision to be tobacco users. For example, individuals were more likely to use tobacco products if they lived in a rural area,84 were aged between 25 and 44,50,85,86 and had lower socioeconomic status.50,85-90 Additionally, men and women can have different attitudes regarding tobacco use.91 For example, men’s views about tobacco use were influenced by prices of tobacco products whereas women’s views about tobacco use were more influenced by body image such as body weight.92

In terms of cognitive factors, individuals were more likely to use tobacco products if they thought that tobacco use was not harmful,93-96 if they thought that the negative consequences would not affect them,97,98 if they thought that the consequences were not important to them,94,99 if they had positive attitude about tobacco use,96,100 and/or if they had little confidence in their ability to abstain from tobacco use.97,98,101-103 In terms of environmental factors, individuals were more likely to use tobacco if their friends and family members did so95-97,104-107 or if tobacco use was accepted culturally or religiously.95,96,108-113 Particularly, religiosity was an important determinant of tobacco-associated behaviors. For example, individuals who attended religious activities more often were less likely to use tobacco.96,108,110,114-116 Finally, individuals were more likely to use tobacco if they had more facilitators and fewer barriers to tobacco use. Examples on tobacco use facilitators include nicotine dependence97,117-119 and ability to use tobacco inside the
Smoking Cessation. The literature has also shown that several demographic, cognitive, and environmental factors may affect smokers’ decision to quit smoking. For instance, smokers were more likely to attempt to quit smoking if they were female\textsuperscript{127} and were younger.\textsuperscript{127-130} In terms of SCT factors, smokers were more likely to quit smoking if they thought there was a health advantage for quitting smoking,\textsuperscript{127,131-133} if they believed that they will gain that advantage if they quit smoking,\textsuperscript{133,134} if they thought the consequences of quitting smoking were important to them,\textsuperscript{133-135} if they had a positive attitude about quitting smoking,\textsuperscript{132,135,136} and/or if they were confident about their ability to quit smoking.\textsuperscript{132,133,137-139} Furthermore, smokers were more likely to quit smoking if they observed friends and family members quitting smoking\textsuperscript{133,140-142} or if they thought continuing to smoke was not culturally accepted.\textsuperscript{133,143} Particularly, acculturation may influence serious attempts to quit smoking. For example, previous research indicated that African American smokers who are less acculturated were more likely to exhibit readiness to quit smoking compared to more acculturated smokers.\textsuperscript{144} With regard to Arab immigrants to the US, it was reported that length of stay in the US was negatively correlated with number of quit attempts.\textsuperscript{145} With regard to religiosity and quitting smoking, weekly attendance of religious services was associated with more likelihood of quitting cigarette smoking.\textsuperscript{146} After gender specific analyses, however, this relation was significant only in women as compared to men.\textsuperscript{146} Finally, smokers were more likely to quit smoking if they had more facilitators and fewer barriers associated with quitting smoking. Examples on smoking cessation facilitators include discussion smoking cessation with health care providers (i.e., behavioral support and
pharmacotherapy), whereas smoking cessation barriers include nicotine dependence and ability to use tobacco inside the home.

Even though the majority of research articles assessed smoking cessation as a binary outcome, some studies have examined smoking cessation in terms of number of serious smoking cessation attempts. It was reported that higher number of serious smoking cessation attempts is associated with higher self-confidence concerning ability to abstain from smoking, more interaction with nonsmokers, lower acculturation, living in a smoke-free home, discussing smoking cessation with health care providers, more nicotine dependence, being male, and having a high school education or higher.

_Lung Screening_. The literature is scant with regard to the demographic, cognitive, and environmental factors that are associated with decisions to undergo lung screening. One reason why information is lacking on this topic is that the guidelines on lung screening were only published by the USPSTF recently. Available data indicates that former smokers, individuals with high socioeconomic status, individuals believing that lung screening is useful, and individuals with higher perceived risk for lung cancer were more likely to show interest in lung screening. However, women, older individuals, current smokers, individuals with limited access to health care, and those having doubts about the benefits of screening were less likely to show interest in lung screening. In particular, men and women can have different attitudes regarding tobacco use, which may influence their eligibility to lung screening.

In terms of the cognitive and environmental factors, higher perceived personal benefits of screening was associated with interest in being screened for lung cancer. Additionally, acculturation may have positive impact on preventive cancer screening behavior. For example, more acculturated individuals were more likely to have cancer screening, although these findings
were not based on the recent guidelines for lung screening. Further, interest in lung screening might be influenced by facilitators such as holding positive views about screening, discussing lung screening with physicians and having health insurance that covers screening expenses. Finally, interest in lung screening might be influenced by barriers such as unawareness of lung screening guidelines, fear of potential negative consequences of screening, or holding fatalistic beliefs about lung cancer, especially when individuals are unfamiliar with screening efficacy, safety, or eligibility.

Theoretical Framework

We utilized the SCT as the theoretical framework for this dissertation. Bandura et al. introduced this theory in 1986 to explain the factors that influence behavioral decisions. In addition to the role of cognitive processes, Bandura suggested that environmental learning, such as observing social norms, influences psychological functioning and behavioral patterns. In other words, individuals internalize the experiences they learn from the social environment. As a result, social or cultural factors become influential enough to determine individuals’ behaviors.

![The Social Cognitive Theory](image)

*Figure 1: Triadic Reciprocity explained by the Social Cognitive Theory*
The SCT suggests that individuals continuously change their behavior based on the interaction between cognitive factors and environmental factors. Bandura described this relationship as the “Triadic Reciprocity” in order to emphasize the reciprocal effect of these 3 elements: cognitive factors, environmental factors, and behavior (Figure 1). The theory proposes that individual behavior is influenced by 1) cognitive factors, which are composed from knowledge of the consequences of the behavior, outcome expectations associated with engaging in the behavior, perceived value of the behavior, attitudes surrounding the behavior, and self-efficacy regarding engaging in the behavior, and 2) environmental factors, which are composed from vicarious learning, perceived social norms, and barriers and facilitators in the environment. The SCT has significantly contributed to health improvement by motivating individuals to adapt healthy habits or refrain from unhealthy or risky behaviors. One way the SCT helps in health betterment is through manipulating environmental factors (e.g., exposure to constructive social norms) in order to guide personal beliefs, and subsequently, modify behavior. In sum, we expect that the SCT can help to identify the association of cognitive and environmental factors with tobacco-related health behaviors and attitudes among adult US Muslims. Specific factors examined in this dissertation are outlined in the paragraphs that follow.

**Cognitive factors**

Cognitive factors include knowledge of the consequences, outcome expectations, perceived value, attitudes, and self-efficacy. Knowledge of the consequences refers to the comprehension of the perceived consequences of the behavior in question. Therefore, individuals’ decision to act (or abstain from an action) is influenced by the knowledge about the perceived consequences of the behavior. Outcome expectations refer to the
perceived benefits or harms to the individual. Thus, individuals consider the benefits or harms associated with the behavior that may affect them when they decide to change or adjust their behavior. Perceived value includes the importance of the consequences to the individual. According to the SCT, perceived value may act as a motivational or a deterrent factor depending on how important the consequences are for the individual. Attitudes refer to the overall opinion of individuals about the behavior, typically measured along a dimension of positive to negative attitudes. Based on the SCT, attitudes influence individuals’ decision in performing behavior. Finally, self-efficacy is the individuals’ confidence in their ability to perform a behavior. Prior studies in the field of health behavior have emphasized the importance of self-efficacy because it is an influential determinant of individuals’ behavior.

Environmental factors

Environmental factors include vicarious learning, social norms, and barriers and facilitators. Vicarious learning is learning by observing the behaviors (e.g., smoking) of family members, friends, and other individuals in the same social environment, and assessing the positive and negative consequences of their behaviors. Social norms refer to the perceived social acceptability of a particular behavior. According to the SCT, individuals may perform a behavior because they think that the behavior is in line with their cultural and religious beliefs, or because they believe that the behavior would result in more social acceptability (e.g., reward or recognition) from family or friends. Similarly, individuals may abstain from performing a behavior because they think that abstinence from performing the behavior is likely to result in social acceptability.
Social norms also include religiosity and acculturation. Religiosity is the level of commitment to shared values among people based on some form of religious or spiritual doctrine. Thus, religiosity is considered a component of social norms. Additionally, acculturation refers to the level of compliance with the host environment, which may induce satisfaction and environmental support. This makes acculturation also a component of social norms. Finally, barriers and facilitators are personal factors (e.g., addiction to nicotine) and situational factors (e.g., access to health care) that make certain behaviors more difficult or easier to perform.

Need for the Study

Considering the elevated rates of tobacco use among the US Muslim population and their growing number in the US, their health practices are becoming more evident and may affect the rest of the US population more noticeably than before. Thus, it is important to address their behaviors and attitudes regarding tobacco use, serious smoking cessation attempts, and risk management in the form of lung screening.

Prior to this dissertation research, there was a scarcity in research that utilized the SCT to examine the impact of religiosity on tobacco use among Muslims in the US. Additionally, there was a gap in the literature concerning the association of SCT factors with tobacco use status among adult Muslims in the US. Addressing the adult Muslim population in the US was driven by elevated risk for the consequences of tobacco use due to high rates of tobacco use among them and lack of theoretically comprehensive studies addressing the effect of cognitive and environmental factors on tobacco use among this population.
Prior to this study, there was a gap in the literature concerning the association of acculturation on serious attempts to quit smoking among adult Muslim smokers in the US. Further, the literature was scarce regarding the effect of SCT factors on serious attempts to quit smoking among adult Muslim smokers in the US. We examined the adult Muslims in the US because of perceived social acceptability of smoking among this population and lack of theoretically sound studies addressing the effect of cognitive and environmental factors on number of serious attempts to quit smoking.

The literature was scant regarding the effect of SCT factors on interest in lung screening among adult US Muslims. Additionally, the literature was scant regarding the description of the knowledge and awareness of lung screening among adult US Muslims. We assessed interest in lung screening because lung cancer is the leading cause of cancer related death in the US.

Aims, Objectives and Hypothesis

The current dissertation aimed to address the above-mentioned gaps in the literature. Specifically, these gaps pertain to the association of SCT factors with (1) tobacco use, (2) serious smoking cessation attempts, and (3) risk management in the form of lung screening among a sample of adult Muslims in the US.

Specific Aim 1: To study the Social Cognitive Theory factors concerning tobacco use among a sample of adult Muslims in the US.

Objective 1.1: To investigate the association of SCT factors with the status of tobacco use among the sample of adult Muslims in the US.

Hypothesis 1.1.1-5: We hypothesized that participants would be more likely to use tobacco (1) if they think that tobacco use is not harmful (as compared to those
who think it is harmful), (2) if they think the negative consequences will not harm them (as compared to those who think it will harm them), (3) if they think the negative consequences of tobacco use are not important to them (as compared to those who think the negative consequences are important to them), (4) if they have a positive attitude about tobacco use (as compared with those who have a negative attitude about tobacco use), and (5) if they have lower self-efficacy regarding abstaining from tobacco use (as compared with those who have higher self-efficacy).

**Hypothesis 1.1.6-8:** We hypothesized that Muslim individuals would be more likely to use tobacco (6) if their friends and family members use tobacco (as compared to those whose friends or family members do not use tobacco), (7) if they think that tobacco use is culturally appropriate (as opposed to those who think that tobacco use is culturally inappropriate), and (8) if they have more facilitators and fewer barriers to tobacco use (as compared to those who have fewer facilitators and more barriers).

**Objective 1.2:** To further address the influence of social norms by investigating the impact of religiosity and acculturation on the status of tobacco use among a sample of adult US Muslims.

**Hypothesis 1.2.1:** We hypothesized that the participants of this study would be less likely to be current tobacco users if they score higher on the religiosity and acculturation scales (as opposed to those who score lower on the religiosity and acculturation scales).
Objective 1.3: To examine the interaction effect of sex and attitudes on tobacco use status in a sample of adult US Muslims.

Hypothesis 1.3.1: We hypothesized that sex would moderate the association between attitudes and tobacco use status.

Specific Aim 2: To study the Social Cognitive Theory factors concerning number of serious attempts to quit cigarette smoking among a sample of adult Muslim smokers in the US.

Objective 2.1: To investigate the association of SCT factors with number of serious attempts to quit cigarette smoking among a sample of adult Muslim smokers in the US.

Hypothesis 2.1.1-5: We hypothesized that the sample of adult Muslim smokers would have more serious cigarette smoking cessation attempts (1) if they think there is a health advantage for quitting smoking (as compared to those who think there is no health advantage for quitting smoking), (2) if they believe they will gain that advantage if they quit smoking (as compared to those who think they will not gain any advantage for quitting smoking), (3) if they believe that gaining the health advantage is important to them (as compared with those believing that gaining the health advantage is not important to them), (4) if they have a positive attitude about quitting smoking (as compared with those who have a negative attitude about quitting smoking), and (5) if they have higher self-efficacy regarding their ability to quit smoking (as compared with those with lower self-efficacy regarding their ability to quit smoking).

Hypothesis 2.1.6-8: We hypothesized that the sample of adult Muslim smokers would have more serious cigarette smoking cessation attempts (6) if their friends
and family members are former smokers (as compared to those who do not have former smokers among their friends and family members), (7) if they think that quitting smoking is culturally an appropriate behavior (as opposed to those who think that quitting smoking is not culturally appropriate), and (8) if they have more facilitators and fewer barriers to quitting smoking (as compared to those who have fewer facilitators and more barriers to quitting smoking).

Objective 2.2: To further address the influence of social norms by investigating the impact of religiosity and acculturation on number of serious attempts to quit cigarette smoking in a sample of adult Muslim smokers in the US.

Hypothesis 2.2.1: We hypothesized that the sample of adult Muslim smokers would have more serious attempts to quit cigarette smoking if they exhibited higher religiosity and lower acculturation (as opposed to those who exhibited lower religiosity and higher acculturation).

Objective 2.3: To examine the interaction effect of sex and religiosity on number of serious attempts to quit cigarette smoking in a sample of adult US Muslim smokers.

Hypothesis 2.3.1: We hypothesized that sex would moderate the association between religiosity and number of serious attempts to quit cigarette smoking.

Specific Aim 3: To study the Social Cognitive Theory factors concerning interest in lung screening among a sample of adult Muslims in the US.

Objective 3.1: To investigate the association of SCT factors with interest in lung screening among a sample of adult US Muslims.
Hypothesis 3.1.1-5: We hypothesized that the study participants would be more likely to have interest in lung screening (1) if they think that screening is associated with health benefits (as compared with those who believe lung screening is not associated with health benefits), (2) if they believe that screening will result in gaining the health benefits (as compared with those believing that lung screening will not result in health benefits), (3) if they believe that the health benefits gained from screening are important to them (as compared with those who think that the health benefits gained from screening are not important to them), (4) if they have a positive attitude about lung screening (as compared with those who have a negative attitude about lung screening), or (5) if they have higher self-efficacy concerning their ability to have lung screening (as compared with those who have lower self-efficacy concerning their ability to have lung screening).

Hypothesis 3.1.6-8: We hypothesized that the study participants would be more likely to have interest in lung screening (6) if their friends and family members have had lung screening (as compared with those whose friends and family members did not have lung screening), (7) if they think that lung screening is culturally an appropriate behavior (as opposed to those who think that lung screening is not culturally appropriate), and (8) if they have more facilitators and fewer barriers to lung screening (as compared to those who have fewer facilitators or more barriers).
Objective 3.2: To further address the influence of social norms by investigating the impact of religiosity and acculturation on interest in lung screening among a sample of adult US Muslims.

Hypothesis 3.2.1: We hypothesized that the study participants would be more likely to have interest in lung screening if they score higher on the religiosity and acculturation scales (as opposed to those who score lower on the religiosity and acculturation scales).

Objective 3.3: To examine the interaction effect of sex and tobacco use history on interest in lung screening in a sample of adult US Muslims.

Hypothesis 3.3.1: We hypothesized that sex would moderate the association between tobacco use status and interest in lung screening.

Conclusion

In the next 3 chapters of this dissertation, we addressed the above-mentioned 3 specific aims. Each of these specific aims was addressed in a separate chapter. Then, we presented these 3 studies in a manuscript-format, with introduction, methods, results, and discussion sections separately for each of these 3 study aims. It is important to note, however, that these study aims were examined in one large study. Therefore, they shared the same procedures including sampling and data collection.

In Chapter 2, we addressed Specific Aim 1 through conducting a multinomial logistic regression model to investigate factors that are associated with tobacco use status of Muslims in the US. In Chapter 3, we addressed Specific Aim 2 by conducting a Poisson regression analysis to investigate the factors that are associated with frequency of cigarette smoking cessation.
attempts among Muslim smokers in the sample. In Chapter 4, we addressed Specific Aim 3 through conducting a binomial logistic regression analysis to investigate the factors that are associated with interest in performing lung screening. Then, we summarized the findings and conclusions of these three manuscripts in Chapter 5. Limitations and strengths of the three manuscripts are also presented in Chapter 5. Finally, the document is concluded with a discussion containing overall implications and future research suggestions.
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Chapter 2

Tobacco Use among a Sample of Adult Muslims in the United States

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Abstract

Background. Muslims in the United States (US) exhibit elevated rates of tobacco use as compared with the general US population. As a result, US Muslims might be at a higher risk for preventive disease and premature death as compared with the general US population.

Objective. This study investigated the Social Cognitive Theory (SCT) factors that are associated with tobacco use among a sample of adult Muslims in the US.

Methods. Data were collected (November 2016 – March 2017) using a cross-sectional, on-line survey from a convenience sample of adult (≥ 18 years) US Muslims. Participants with a lung cancer history were excluded. Associations between SCT factors and tobacco use were investigated with bivariate analyses and multinomial logistic regression models.

Results. Eligible participants (n=271) from 30 states completed the survey; 52.8% reported current tobacco use. A higher rate of current tobacco use was reported by men (62.8%) as compared to women (41.3%), $\chi^2(1, N = 271) = 12.49, p < 0.001$. In terms of cognitive factors, individuals who 1) expect more personal consequences for tobacco use on health, and 2) have more confidence regarding ability to abstain from tobacco use, were less likely to report current tobacco use. In terms of environmental factors, individuals whose family members do not use tobacco were less likely to report current tobacco use. An interaction between sex and attitudes indicated that women with negative views about tobacco were less likely to report current use compared to men with negative views about tobacco.

Conclusion. Several cognitive and environmental factors can influence tobacco use. The study findings suggest that family-oriented interventions emphasizing self-efficacy and personal
consequences to prevent tobacco use can potentially be effective in reducing tobacco use rates in the adult US Muslim population.

**Key words:** Muslims, Tobacco Use, Social Cognitive Theory, Acculturation, Religiosity, Social Norms.
Introduction

Tobacco use is a major cause of premature death and preventable illness in the United States (US). Additionally, tobacco use is strongly associated with several behavioral disorders such as substance abuse. Although the cigarette smoking rate has declined since the 1960s, the overall rate of tobacco use has been constant over the past few years (21.3%). The rates may even be higher among minorities such as US Muslims who may also experience higher rates of mortality and morbidity due to elevated rates of tobacco use. Estimates of the number of Muslims in the US vary, ranging between 3 and 7 million. Even though Islam has existed in the US since several hundred years ago, research has shown that 63% of current US Muslims are foreign-born. The number of foreign-born US Muslims may continue to grow because of increased immigration to the US, attributed to political instability in several countries with a predominantly Muslim population. US Muslims are more likely to use tobacco as compared to the US general population, as tobacco use is culturally accepted in some Muslim majority countries. For example, 22.4% of US Muslims use waterpipes, whereas 1.3% of the US population use them. Historically, some Islamic scholars had deemed tobacco use acceptable from a religious point of view before its negative health impact was revealed, which may explain its use among Muslims. Further, US Muslims may favor cultural or spiritual healing methods, and can either delay seeking health care, or exhibit reluctance to receiving western medicine. Thus, US Muslims may evidence health disparities and worse health outcomes due to negative health behaviors, such as tobacco use.

Previous studies investigating tobacco use in US Muslims were limited by investigating only a certain age group (e.g., college students), a single ethnicity (e.g., Arabs), one form of tobacco (e.g., water-pipes), or residents of one area (e.g., New York city and suburbs). Most
importantly, they have not used a comprehensive behavioral model. Understanding the combined impact of cognitive and environmental factors on tobacco use behavior is particularly important for developing potential prevention and cessation modalities in the Muslim population. Thus, this study sought to understand factors that are associated with tobacco use in US Muslims using the Social Cognitive Theory (SCT).20

The SCT presumes that 1) behavior interacts with 2) cognitive factors including knowledge of the consequences and outcome expectations associated with engaging in a specific behavior, and the perceived value, attitudes, and self-efficacy associated with changing this behavior, and 3) environmental factors including vicarious learning, perceived social norms surrounding the behavior, and barriers and facilitators of engaging in that behavior. This interaction is known as the “Triadic Reciprocity.”20 Because the majority of US Muslims are foreign-born,11 they may have different health beliefs and attitudes, as well as different customs and social values. Thus, the SCT was appropriate to utilize for analyzing the factors associated with use of tobacco products among US Muslims due to its comprehensive inclusion of cognitive and environmental factors.

*Cognitive factors* in the SCT model can be applied to factors affecting tobacco use. **Knowledge** of the consequences refers to perceived understanding of the health consequences of tobacco use;21,22 individuals are more likely to use tobacco if they think it is not harmful.22,23 **Outcome expectations** refer to the perceived personal benefits or harms associated with tobacco use;21,22 greater likelihood of tobacco use is associated with believing negative consequences will not have a personal impact.22,23 **Perceived value** refers to the perceived importance of the consequences of behavior.22,24 For example, individuals are more likely to use tobacco products if they think that avoiding the negative consequences of tobacco use is not important to them.23
**Attitudes** refer to the overall opinion with regard to a certain behavior;\(^{24}\) with more positive views about tobacco associated with greater likelihood of use.\(^{22}\) It is also important to note that men and women may have different attitudes regarding tobacco use in the Muslim population, evidenced by their different rates of tobacco use.\(^{25}\) For example, men’s views about tobacco use could be more influenced by prices of tobacco products whereas women’s views about tobacco use could be more influenced by body image such as body weight.\(^{26}\) Finally, **self-efficacy** is individuals’ confidence in their ability to perform certain behaviors.\(^{21}\) Tobacco users with low self-efficacy may believe that they will have little success in quitting tobacco use.\(^{27}\)

*Environmental factors* from the SCT are also key predictors of tobacco use. **Vicarious learning**, observation of others performing a behavior, has an important role in predicting behavior.\(^{24}\) Individuals are more likely to use tobacco if their friends and family members do so.\(^{23,28-30}\) Additionally, **social norms**, which are cultural standards of behavior, highly influence behavior.\(^{21,24}\) Believing that using tobacco is culturally acceptable is associated with greater likelihood of tobacco use.\(^{23}\) In particular, religiosity is the individuals’ degree of adherence to the beliefs, doctrines, and practices of a particular religion.\(^{31}\) Thus, religiosity is a measure of the degree of conformity between individual religious attitudes and teachings and norms of the religion he/she believes in. It has been reported that individuals who attend more religious activities are less likely to report current tobacco use.\(^{32}\)

Acculturation is another environmental factor that influences adoption of social norms. It measures the level of compliance with the host cultural environment.\(^{33}\) Research on US Muslim population has shown that individuals with less acculturation (less compliance with US main culture) are more likely to use tobacco than those who are fully acculturated.\(^{34,35}\) Finally, **barriers and facilitators**, which can be external environmental factors, are determinants of
behavior related to using tobacco. Examples of these barriers and facilitators include discussing tobacco use with health care providers and whether using tobacco is allowed inside the home.

The current study aimed to investigate factors associated with tobacco use among a sample of adult US Muslims. The first objective was to investigate the associations between tobacco use and cognitive as well as environmental factors in a convenience sample of adult US Muslims. The first hypothesis was that participants would be more likely to report current tobacco use if they think that tobacco use is not harmful, if they think the negative consequences will not harm them, if they think the negative consequences of tobacco use are not important to them, if they have a positive attitude about tobacco use, if they have lower self-efficacy regarding ability to abstain from tobacco use, if their friends and family members use tobacco, or if they believe that tobacco use is culturally accepted. The second objective was to further address the influence of social norms by investigating the impact of religiosity and acculturation on tobacco use status in a convenience sample of adult US Muslims. The second hypothesis was that greater religiosity and greater acculturation would be associated with a lower likelihood of reporting current tobacco use. The third objective was to examine the interaction effect of sex and attitudes on tobacco use status in a convenience sample of adult US Muslims. The third hypothesis was that sex would moderate the association between attitudes and tobacco use status.

Methods

Participants

Because Muslims constitute only 1-2% of the US population, collecting data utilizing random sampling design was not feasible. Therefore, participants were recruited through convenience and snowball sampling procedures. Eligibility criteria included adult (≥ 18 years
old) US Muslims with no history of lung cancer. Lung cancer patients were excluded because they may have fundamentally different behaviors concerning tobacco use, perhaps due to greater interaction with health care providers.

**Procedures**

Using web-based search engines, an Internet search was conducted to identify Islamic centers and organizations in the US. Once Institutional Review Board approval was obtained, an online advertisement, a cover letter, and a link to the survey were sent to these centers and organizations relying on the contact information that was available online for them. These centers and organizations were asked about their willingness to share the study information with members of their communities. Further, the online advertisement was posted on their Facebook webpages if they allowed the public to post ads.

A cross-sectional design with an on-line survey was utilized to collect data. The Qualtrics platform was utilized as a survey tool to collect data. The questionnaire was administered in English, Arabic, Farsi, and Urdu, which were chosen based on previous research on US Muslims. After the questionnaire was translated from English to these three other languages, different translators back-translated the Arabic and Farsi versions to English in order to verify the accuracy of the translation. Any differences between the original version and the back-translated versions were reconciled, when such differences existed. Back translation to Urdu was limited by not having a locally-available translator. The questionnaire took approximately 15 minutes to complete. Duplicate records were identified through examining Internet Protocol (IP) address and age, and subsequently were removed. To maximize participation, three participants were randomly selected to win a $50 gift card each. Participants who desired to enter the gift
card pool entered their e-mail addresses in a separate webpage after they completed the questionnaire. E-mail addresses were not linked to responses and were saved in a separate data file. Data were collected from November 2016 to March 2017.

Measures

The primary variable of interest was tobacco use. This variable consisted of 3 categories: 1) current user; 2) former user; and 3) non-user. These categories were derived using four items; 2 items that measured cigarette smoking and 2 more items that measured use of other tobacco products. As defined in previous research,\textsuperscript{39,40} current tobacco users were those who 1) smoked at least 100 cigarettes in lifetime and currently smoked “some days” or “every day”, or 2) used any type of tobacco during the past 30 days. Former tobacco users were defined as those who 1) smoked at least 100 cigarettes in lifetime but reported that they currently did “not at all” smoke, or 2) used other types of tobacco in lifetime but did not use it during the past 30 days. Non-users were defined as those who 1) did not smoke at least 100 cigarettes in lifetime, and 2) never tried any other tobacco products.

Demographic Characteristics. Sex, age, race, ethnicity, marital status, education, employment status, income, and health insurance status were assessed using one item for each. General well-being was evaluated through measuring self-assessed health using a 5-point Likert scale item (1=poor – 5=excellent),\textsuperscript{41} which was transformed into a continuous scale from zero (poor) to 100 (excellent) to present the linear relationship between item scores and the underlying health concept as guided by previous research.\textsuperscript{42}

Cognitive factors. Cognitive factors were measured using one item for each. Knowledge of the consequences was measured with a 5-point response scale (1=less than 20% – 5=more
than 80%) that assessed perceived likelihood of disease or death as a result of tobacco use.\textsuperscript{43} **Outcome expectations** were measured with a 5-point scale (1=not at all – 5=extremely) that assessed perceived effect of tobacco use on the respondent’s personal health.\textsuperscript{44} **Perceived value** was measured with a 5-point scale (1=not at all important – 5=extremely important) that assessed participants’ perceived importance of abstaining from tobacco use.\textsuperscript{45} **Attitudes** were measured using a 5-point scale (1=very negative – 5=very positive) that assessed participants’ overall opinions on using tobacco.\textsuperscript{46} However, it was dichotomized during analysis to examine the interaction with sex. Finally, **self-efficacy** was measured using a continuous scale (0% – 100%) that assessed how certain individuals were that they could abstain from tobacco use.\textsuperscript{47}

**Environmental factors.** **Vicarious learning** was measured using two items, which inquired about whether there was a tobacco user among (1) first-degree family members and (2) friends.\textsuperscript{48} **Social norms** were also measured using two items, which addressed the perceived appropriateness of using tobacco products among (1) first-degree family members and (2) friends.\textsuperscript{49} Responses to social norms constructs were assessed using a 5-point scale, but collapsed into 3-point scales (1=inappropriate, 2=neither appropriate nor inappropriate, 3= appropriate) during analyses due to lack of sufficient distribution. Religiosity was assessed using the Duke University Religion Index,\textsuperscript{50} a 5-item scale that demonstrated high internal consistency in the Muslim population (α=0.87 to 0.92).\textsuperscript{51} Responses were normalized to construct an overall scale from zero to 100. Acculturation was measured with the Brief Acculturation Scale, a 4-item scale that measures language preference, self-identity, country where participants spent childhood, and place of birth. This scale has demonstrated good internal consistency (α=0.84).\textsuperscript{52} Again, acculturation overall score was normalized to range from zero to 100. With regard to **barriers and facilitators**, one item measured whether a health care professional has asked participants,
any time during the past 12 months, about their tobacco use status. Additionally, rules of using tobacco inside the home were assessed using one item with a 3-point response scale (1=not allowed, 2=allowed in some places, 3=allowed anywhere). During analysis, this item was collapsed into 2 categories due to lack of distribution (1=not allowed, 2=allowed at least sometimes or in some places).

**Statistical Analysis**

The bivariate relationships between the primary variable of interest (i.e., tobacco use status) and variables of interest based on the SCT (i.e., cognitive and environmental factors) as well as demographic variables were tested with Chi-square tests, Fisher's exact test, Pearson’s correlation coefficients, and Kendall’s Tau correlation tests as appropriate. Due to lack of sufficient distribution, marital status, employment status, race, and sect variables were collapsed into binary variables. Education was collapsed into 4 categories. To accommodate multiple comparisons, a Bonferroni correction was utilized.

As tobacco use consisted of 3 categories, multinomial logistic regression was utilized to compare current use and former use with non-use. Variables with modest association \((p \leq 0.1)\) with tobacco use in the bivariate analyses were included in multinomial logistic regression models. Unadjusted multinomial logistic regression was conducted followed by adjusted multinomial logistic regression. In both models, “non-use” was the reference group. Because sex interacted with attitudes and caused instability in the model, these 2 variables were replaced with an interaction variable (attitude by sex) in the final multinomial logistic regression analyses.
Results

Three hundred seventy participants completed the questionnaire, of which 98 participants did not meet the eligibility criteria (4 participants younger than 18 years old, 61 participants from outside the US, 25 participants did not affiliate with Islam, and 8 participants had a personal history of lung cancer). One duplicate record was identified. Eligible participants (n=271) completed the questionnaire in English (n=180), Arabic (n=88), Farsi (n=2), and Urdu (n=1). Participants’ age ranged from 19 to 70 with a median age of 32. The majority of participants (60.2%) were foreign-born. Only 3 participants reported being Hispanic or Latino/a. The majority of respondents (68.3%) reported discussing tobacco use with their physicians. More than half of the sample (52.8%) reported current tobacco use. Out of all current tobacco users (n=143), the most commonly used tobacco products were cigarettes (92.3%) and water-pipes (55.9%), followed by electronic cigarettes (12.6%), as well as cigars (11.2%). Only 31.7% of those who completed the questionnaire in English reported non-use of tobacco whereas 44.0% were non-users among participants who completed the questionnaire in other languages \(\chi^2(2, N = 271) = 5.6, p = .059\]. More than half of current tobacco users (n=74) reported concurrent use of more than one tobacco product. Results of the bivariate analyses are shown in Table 1. Wald chi-square test values, unadjusted odds ratios, and confidence intervals are shown in Table 2. Sixteen variables were significantly associated with current use (as opposed to non-use), whereas 6 variables were significantly associated with former use (as opposed to non-use). As shown in Table 3, individuals with higher expectations, greater self-efficacy, and no tobacco users among their family members were less likely to report current tobacco use as opposed to non-use. Individuals with higher self-assessed health, greater knowledge, lower religiosity, and friends who are tobacco users were less likely to report being a former tobacco user as opposed to non-
user. Finally, there was an interaction between sex and attitudes in association with tobacco use status. Among those with negative attitudes, women were less likely than men to report current tobacco use rather than non-use.

Discussion

This study aimed to investigate the association between tobacco use and cognitive as well as environmental factors in a sample of adult US Muslims. Due to the key associations between tobacco use status and religiosity as well as acculturation, these relationships were also investigated in the sample. Elevated rates of current tobacco use in the study sample (52.8%) aligns with rates reported in previous research on US Muslims. This may indicate little receptiveness for tobacco cessation interventions by US Muslims or a lack of exposure to such interventions. Additionally, the finding that men were more likely to report current tobacco use compared to women may be explained by potential cultural constraints on tobacco use among women in certain countries, which can be source countries for immigration to the US. Such constraints may lead to reduced tobacco use rates or under-reporting of tobacco use by women. Nevertheless, this statistic was consistent with previous research on adults in the US.

The lower-rated self-assessed health in former users as compared to non-users has several potential interpretations. Former users may believe that the detrimental impact of tobacco use on health is irreversible, and therefore, quitting tobacco is insufficient to restore pre-tobacco health status. Another explanation might be that another health condition arose that made former users discontinue tobacco use. This finding suggests that more effort may be needed to educate the US Muslim population about the positive, but gradual, health consequences of quitting tobacco.
Several cognitive factors played a role in tobacco use. Consistent with previous research, study participants were less likely to report current tobacco use if they had higher self-efficacy regarding their ability to abstain from tobacco and if they believed that tobacco use causes negative personal health consequences (i.e., higher expectations). Because these two factors may be protective against initiating tobacco, the findings affirm the importance of enhancing self-efficacy and educating the US Muslim population about the personal impact of tobacco use on health. In addition, participants with higher knowledge about the general consequences of tobacco use were less likely to report being a former user rather than non-user. These findings, however, should be understood in light of the fact that the majority of participants (60.2%) were foreign-born. Due to spending part of their lifespan outside the US, they may not have had sufficient education about how tobacco use can negatively affect health, which is evident in high rates of current tobacco use rates in the sample. Therefore, when providing care to Muslim immigrants, health care providers may need to assess patients’ awareness and knowledge of the consequences of tobacco use. However, compared with 55.3% of the US population who reported being asked by their health care providers about tobacco use, a higher percentage of adult US Muslims (68.3%) reported the same, which may indicate better patient-provider communication about tobacco use among adult US Muslims. Finally, the interaction noted between attitudes and sex in association with tobacco use suggests that sex plays a moderating effect in the relation between attitudes and tobacco use. This indicates the importance of considering sex-related differences in tobacco use behavior. If attitudes are addressed in future interventions, different messages regarding tobacco cessation for men and women might be needed.
Environmental factors are also critical in understanding tobacco use in the US Muslim population. Consistent with the hypotheses, participants were less likely to report current use of tobacco if none of their first-degree family members were current users. Considering the importance of family-connectedness and its influence on health behavior among US Muslims, the study results affirm the importance of devising family-based prevention strategies that aim to control tobacco use in this population. In sum, future approaches to curb tobacco use in US Muslims might include measures to encourage families to stop modeling smoking.

Having friends who were tobacco users was more likely among non-users as opposed to former users. Those who never used tobacco might have vicariously learned the negative consequences of using tobacco from friends, not the behavior of using tobacco itself; the behavior itself may have been learned from observing parents—a stronger and longer source of vicarious learning. Thus, being in contact with friends who were tobacco users may have equipped the participants with knowledge that shielded them from initiating tobacco use. Another interpretation might be that former users have restrained from socializing with friends who use tobacco in order to reduce temptation for tobacco use.

In terms of religiosity, individuals with higher religiosity were more likely to report former tobacco use rather than non-use. However, non-users and current users did not significantly differ in religiosity. Perhaps having higher religiosity was a cue to quitting tobacco use among former users, but not protective against initiating tobacco use among non-users.

Although acculturation was not significantly associated with tobacco use status in the multinomial logistic regression model, acculturation might still be an important factor because of two observations. First, descriptive analyses demonstrated a trend between language of completing the questionnaire and non-use of tobacco. Second, acculturation showed modest
association with tobacco use status in the bivariate analysis and the unadjusted multinomial regression analysis. Therefore, examining the influence of acculturation on tobacco use status might be warranted in future research.

The findings of this study should be interpreted in light of certain limitations. First, due to the difficulty in accessing the Muslim population, the convenience and snowball sampling techniques may limit the study generalizability to adult Muslims in the US. This limitation, however, is mitigated by the fact that the study participants came from several states across the US (30 states). Second, causality cannot be inferred for any of the observed associations due to the cross-sectional design. Additionally, interpretation of above-mentioned associations can be understood in different ways. For example, lower self-efficacy reported among current tobacco users could be the outcome - and not the predictor - of current tobacco use. Third, because recruiting was done online (using websites and social media sites) and because it was voluntary, estimating the response rate was not possible. Therefore, non-response bias might be a concern. Fourth, unlike items that were used to measure other cognitive factors, the self-efficacy item examined \textit{abstaining} from tobacco use, not tobacco use itself. This might have created confusion among participants when completing the survey. Fifth, we utilized single-item measures, which may result in limited validity of data. Additionally, aside from back translation, the survey was not piloted; this may threaten the reliability and validity of the findings. Finally, we acknowledge that the study is underpowered due to small sample size. Thus, odds ratios for some associations in the multinomial logistic model had wide confidence intervals, and therefore, limited reliability. However, despite not meeting the recommended sample size as suggested by previous research,\textsuperscript{61} this exploratory study has identified some significant associations that provided a rich seminal work for future research on this population.
The SCT provided a sound theoretical framework to study tobacco use in this population. This is the first study to investigate the associations between tobacco use and cognitive as well as environmental factors in adult US Muslims using the SCT. This study is expected to be a seminal work for future research that addresses means of manipulating certain factors to curb tobacco use in this population. The findings presented several social and health care-related implications. For example, the study findings demonstrated the importance of family members’ tobacco use status, outcome expectations, and abstinence self-efficacy in tobacco use behavior in US Muslims. Therefore, Muslim parents and family members may act as role models to equip their family members with the needed awareness and confidence against initiating tobacco use. In terms of health care, the findings of this study may demonstrate the need for increasing awareness of the negative health impacts of tobacco on health among US Muslims. For example, future interventions based on the SCT that aim to reduce tobacco use may educate adult US Muslims about the healthcare-based assistance they can receive, such as prescription medications or nicotine replacement. Such interventions can also demonstrate techniques that aid in quitting tobacco use. As opposed to only unrelated individuals, getting entire families or groups of friends involved in tobacco cessation interventions could potentially be more effective as individuals vicariously learn from their family members and friends the skills of quitting tobacco use.

Considering the findings related to the potential influence of religiosity on tobacco use in our research, future research may investigate the association between religiosity and quitting tobacco in longitudinal studies among adult US Muslim tobacco users in order to understand how this construct can be used to improve quitting tobacco use in this population.
Acknowledgement

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Bibliography


Table 1. Variables of Interest by Tobacco Use Categories. Muslim Adults (≥ 18 years) in the United States (Numbers, Row Percentages, and Bivariate Tests Statistics)  

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non-user (N = 97, 35.8% (Row Percentage)</th>
<th>Former User (N = 31, 11.4% (Row Percentage)</th>
<th>Current User (N = 143, 52.8% (Row Percentage)</th>
<th>Test Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>Male 41 (28.3%) *</td>
<td>13 (9.0%)</td>
<td>91 (62.8%)</td>
<td>(x^2(2, N = 271) = 12.49, p = 0.002)</td>
</tr>
<tr>
<td></td>
<td>Female 56 (44.4%)</td>
<td>18 (14.3%)</td>
<td>52 (41.3%)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>M=35.35 (SD=11.70)</td>
<td>M=34.22 (SD=10.28)</td>
<td>M=35.16 (SD=13.48)</td>
<td>(r = 0.077, n = 271, p = 0.204)</td>
</tr>
<tr>
<td>Education (Scale from 1 – 4)</td>
<td>M=2.87 (SD=1.03)</td>
<td>M=3.04 (SD=0.98)</td>
<td>M=2.87 (SD=0.99)</td>
<td>(\tau = 0.001)</td>
</tr>
<tr>
<td>Ever changed religion</td>
<td>No 92 (36.2%) *</td>
<td>25 (9.8%) *</td>
<td>137 (53.9%) *</td>
<td>(x^2(2, N = 271) = 10.28, p = 0.006)</td>
</tr>
<tr>
<td>Sect followed</td>
<td>Yes 5 (29.4%)</td>
<td>6 (35.3%) *</td>
<td>6 (35.3%) *</td>
<td></td>
</tr>
<tr>
<td>Self-assessed Health</td>
<td>M=82.62 (SD=19.54)</td>
<td>M=87.94 (SD=15.90)</td>
<td>M=73.10 (SD=24.21)</td>
<td>(r = 0.394, n = 271, p = 0.001)</td>
</tr>
<tr>
<td>Income (Scale from 1 – 9)</td>
<td>M=5.31 (SD=1.98)</td>
<td>M=5.39 (SD=2.04)</td>
<td>M=5.32 (SD=2.33)</td>
<td></td>
</tr>
<tr>
<td>Health insurance</td>
<td>No 5 (23.8%)</td>
<td>2 (9.5%)</td>
<td>14 (66.7%)</td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td>Yes 92 (36.8%)</td>
<td>29 (11.6%)</td>
<td>129 (51.6%)</td>
<td>(FET (N = 271) = 1.66, p = 0.389)</td>
</tr>
<tr>
<td>Race</td>
<td>White 70 (35.7%)</td>
<td>23 (11.7%)</td>
<td>103 (52.6%)</td>
<td>(x^2(2, N = 271) = 0.06, p = 0.970)</td>
</tr>
<tr>
<td>Employment Status</td>
<td>Non-white 27 (36.0%)</td>
<td>8 (10.7%)</td>
<td>40 (53.3%)</td>
<td></td>
</tr>
<tr>
<td>Self-assessed Health</td>
<td>Employed 63 (34.8%)</td>
<td>18 (9.9%)</td>
<td>100 (55.2%)</td>
<td>(x^2(2, N = 271) = 1.85, p = 0.397)</td>
</tr>
<tr>
<td>Cognitive Factors</td>
<td>Not employed 34 (37.8%)</td>
<td>13 (14.4%)</td>
<td>43 (47.8%)</td>
<td></td>
</tr>
<tr>
<td>Knowledge (Scale from 1 – 5)</td>
<td>M=3.13 (SD=1.36)  *</td>
<td>2 (11.1%)</td>
<td>20 (57.6%)</td>
<td>(r = 0.204, n = 271, p &lt; 0.001)</td>
</tr>
<tr>
<td>Expectations (Scale from 1 – 5)</td>
<td>M=3.34 (SD=1.28)</td>
<td>1 (6.7%)</td>
<td>27 (77.4%)</td>
<td>(r = 0.671, n = 271, p &lt; 0.001)</td>
</tr>
<tr>
<td>Attitudes</td>
<td>Negative 94 (58.8%)</td>
<td>29 (18.1%)</td>
<td>37 (23.1%)</td>
<td></td>
</tr>
<tr>
<td>Perceived value (Scale from 1 – 5)</td>
<td>M=3.42 (SD=1.51)  *</td>
<td>5 (6.9%)</td>
<td>40 (54.3%)</td>
<td>(x^2(2, N = 271) = 0.06, p = 0.970)</td>
</tr>
<tr>
<td>Self-efficacy (Scale from 0 – 100)</td>
<td>M=62.73 (SD=30.93)  *</td>
<td>13 (14.4%)</td>
<td>43 (47.8%)</td>
<td></td>
</tr>
<tr>
<td>Environmental Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A Tobacco User Family Member</td>
<td>No 69 (63.9%) *</td>
<td>25 (21.3%)</td>
<td>118 (72.4%)</td>
<td>(x^2(2, N = 271) = 0.35, p = 0.520)</td>
</tr>
<tr>
<td>A Tobacco User Friend</td>
<td>Yes 28 (17.7%)</td>
<td>17 (10.4%)</td>
<td>118 (72.4%)</td>
<td></td>
</tr>
<tr>
<td>Family-related social norms (Scale from 1 – 3)</td>
<td>M=1.57 (SD=0.59)  *</td>
<td>5 (9.3%)</td>
<td>6 (10.6%)</td>
<td>(r = 0.204, n = 271, p &lt; 0.001)</td>
</tr>
<tr>
<td>Friends-related social norms (Scale from 1 – 3)</td>
<td>M=1.95 (SD=0.75)  *</td>
<td>5 (9.3%)</td>
<td>6 (10.6%)</td>
<td>(r = 0.204, n = 271, p &lt; 0.001)</td>
</tr>
<tr>
<td>Acculturation (Scale from 0 to 100)</td>
<td>M=53.15 (SD=31.52)  *</td>
<td>14 (10.3%)</td>
<td>118 (72.4%)</td>
<td></td>
</tr>
<tr>
<td>Religiosity (Scale from 0 – 100)</td>
<td>M=59.09 (SD=32.56)  *</td>
<td>5 (9.3%)</td>
<td>6 (10.6%)</td>
<td>(r = 0.204, n = 271, p &lt; 0.001)</td>
</tr>
<tr>
<td>Tobacco Use Inside Home</td>
<td>Not allowed 80 (57.6%)</td>
<td>32 (23.0%)</td>
<td>46 (31.2%)</td>
<td>(FET (N = 271) = 0.115, p = 0.034)</td>
</tr>
<tr>
<td>Physician asked about tobacco status</td>
<td>Yes 67 (36.2%)</td>
<td>45 (25.3%)</td>
<td>93 (53.0%)</td>
<td>(x^2(2, N = 271) = 0.24, p = 0.889)</td>
</tr>
</tbody>
</table>

**Abbreviations:** \(x^2\), Chi-square; FET, Fisher's exact test; \(\tau\), Kendall's Tau-b correlation; \(r\), Pearson correlation coefficient; N, number of subjects included in the analysis; \(p\), significance level or p-value; M, mean; SD, standard deviation. * A category that is significantly different from the other 2 categories combined (horizontal comparison).
Table 2. Unadjusted Odds Ratios, 95% Confidence Interval, and Wald Chi-Square from Multinomial Logistic Regression on Tobacco Use categories. Adult (≥18 years) Muslims in the United States (Reference Category for Tobacco Use = Non-users)

<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>Current User</th>
<th></th>
<th>Former User</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>UOR (95% CI)</td>
<td>Wald</td>
<td>p-value</td>
<td>UOR (95% CI)</td>
<td>Wald</td>
<td>p-value</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2.390 (1.410 - 4.051)</td>
<td>10.478</td>
<td>.001**</td>
<td>0.986 (0.435 - 2.238)</td>
<td>0.001</td>
</tr>
<tr>
<td>Female</td>
<td>[Reference]</td>
<td>[Reference]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever changed religion</td>
<td>0.752 (0.580 – 0.974)</td>
<td>4.651</td>
<td>.031*</td>
<td>0.843 (0.565 – 1.259)</td>
<td>0.694</td>
</tr>
<tr>
<td>No</td>
<td>1.241 (0.368 – 4.186)</td>
<td>0.121</td>
<td>.728</td>
<td>0.226 (0.064 – 0.804)</td>
<td>5.283</td>
</tr>
<tr>
<td>Yes</td>
<td>[Reference]</td>
<td>[Reference]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sect followed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunnah</td>
<td>0.500 (0.296 – 0.843)</td>
<td>6.759</td>
<td>.009**</td>
<td>2.510 (0.987 – 6.383)</td>
<td>3.735</td>
</tr>
<tr>
<td>Something else</td>
<td>[Reference]</td>
<td>[Reference]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>General Well-being</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-assessed Health</td>
<td>0.978 (0.963 - 0.994)</td>
<td>7.599</td>
<td>.006**</td>
<td>0.962 (0.942 - 0.982)</td>
<td>13.602</td>
</tr>
<tr>
<td><strong>Cognitive Factors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>0.318 (0.240 - 0.423)</td>
<td>62.143</td>
<td>&lt;.001***</td>
<td>0.935 (0.642 - 1.363)</td>
<td>0.121</td>
</tr>
<tr>
<td>Expectations</td>
<td>0.192 (0.129 - 0.285)</td>
<td>66.740</td>
<td>&lt;.001***</td>
<td>1.461 (0.840 - 2.542)</td>
<td>1.800</td>
</tr>
<tr>
<td><strong>Attitudes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>0.011 (0.003 – 0.037)</td>
<td>53.163</td>
<td>&lt;.001***</td>
<td>0.463 (0.074 – 2.905)</td>
<td>0.676</td>
</tr>
<tr>
<td>Positive</td>
<td>[Reference]</td>
<td>[Reference]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived value</td>
<td>0.193 (0.131 - 0.285)</td>
<td>68.677</td>
<td>&lt;.001***</td>
<td>0.896 (0.526 - 1.526)</td>
<td>0.163</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>0.929 (0.914 - 0.945)</td>
<td>72.985</td>
<td>&lt;.001***</td>
<td>1.020 (0.993 - 1.049)</td>
<td>2.067</td>
</tr>
<tr>
<td><strong>Environmental Factors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vicarious learning – Family</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0.086 (0.046 - 0.159)</td>
<td>61.011</td>
<td>&lt;.001***</td>
<td>0.334 (0.145 - 0.768)</td>
<td>6.657</td>
</tr>
<tr>
<td>Yes</td>
<td>[Reference]</td>
<td>[Reference]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vicarious learning – Friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0.077 (0.029 - 0.207)</td>
<td>25.778</td>
<td>&lt;.001***</td>
<td>2.948 (1.284 - 6.769)</td>
<td>6.497</td>
</tr>
<tr>
<td>Yes</td>
<td>[Reference]</td>
<td>[Reference]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social norms - Family</td>
<td>5.679 (3.291 - 9.798)</td>
<td>38.940</td>
<td>&lt;.001***</td>
<td>2.227 (1.021 - 4.586)</td>
<td>4.050</td>
</tr>
<tr>
<td>Social norms - Friends</td>
<td>5.996 (3.694 - 9.733)</td>
<td>52.515</td>
<td>&lt;.001***</td>
<td>0.866 (0.440 - 1.705)</td>
<td>0.174</td>
</tr>
<tr>
<td>Acculturation</td>
<td>1.009 (1.000 - 1.018)</td>
<td>3.977</td>
<td>.046*</td>
<td>1.006 (0.991 - 1.020)</td>
<td>0.608</td>
</tr>
<tr>
<td>Religiosity</td>
<td>0.958 (0.946 - 0.970)</td>
<td>43.598</td>
<td>&lt;.001***</td>
<td>1.025 (1.001 - 1.050)</td>
<td>4.019</td>
</tr>
<tr>
<td>Tobacco use inside home</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not allowed</td>
<td>0.061 (0.032 – 0.118)</td>
<td>69.891</td>
<td>&lt;.001***</td>
<td>1.433 (0.444 – 4.637)</td>
<td>0.363</td>
</tr>
<tr>
<td>Allowed</td>
<td>[Reference]</td>
<td>[Reference]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: UOR, Unadjusted Odds Ratio; CI, Confidence Interval; Wald, Wald Chi-square.

* 0.01 ≤ p-value < 0.05.
** 0.001 ≤ p-value < 0.01.
*** p-value < 0.001.
Table 3. Adjusted Odds Ratios, 95% Confidence Interval, and Wald Chi-Square from Multinomial Logistic Regression on Tobacco Use categories. Adult (≥18 years) Muslims in the United States (Reference Category for Tobacco Use = Non-users)

<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>Current User</th>
<th>Former User</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AOR (95% CI)</td>
<td>Wald p-value</td>
</tr>
<tr>
<td>Education</td>
<td>0.885 (0.370 – 2.116)</td>
<td>0.075 .784</td>
</tr>
<tr>
<td>Ever changed religion</td>
<td>0.003 (0.000 – 1.330)</td>
<td>3.493 .062</td>
</tr>
<tr>
<td>Sect followed</td>
<td>[Reference]</td>
<td>[Reference]</td>
</tr>
<tr>
<td>Education</td>
<td>[Reference]</td>
<td>[Reference]</td>
</tr>
<tr>
<td>Ever changed religion</td>
<td>[Reference]</td>
<td>[Reference]</td>
</tr>
<tr>
<td>Sect followed</td>
<td>[Reference]</td>
<td>[Reference]</td>
</tr>
<tr>
<td>General Well-being</td>
<td>0.974 (0.935 – 1.014)</td>
<td>1.638 .201</td>
</tr>
<tr>
<td>Cognitive Factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>1.085 (0.532 – 2.214)</td>
<td>0.050 .823</td>
</tr>
<tr>
<td>Expectations</td>
<td>0.317 (0.114 – 0.880)</td>
<td>4.863 .027*</td>
</tr>
<tr>
<td>Perceived value</td>
<td>0.588 (0.270 – 1.277)</td>
<td>1.800 .180</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>0.938 (0.901 – 0.977)</td>
<td>9.605 .002**</td>
</tr>
<tr>
<td>Environmental Factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vicarious learning – Family</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0.048 (0.007 – 0.333)</td>
<td>9.439 .002**</td>
</tr>
<tr>
<td>Yes</td>
<td>[Reference]</td>
<td>[Reference]</td>
</tr>
<tr>
<td>Vicarious learning – Friends</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0.104 (0.002 – 4.498)</td>
<td>1.386 .239</td>
</tr>
<tr>
<td>Yes</td>
<td>[Reference]</td>
<td>[Reference]</td>
</tr>
<tr>
<td>Social norms - Family</td>
<td>0.603 (0.129 – 2.818)</td>
<td>0.414 .520</td>
</tr>
<tr>
<td>Social norms - Friends</td>
<td>1.925 (0.389 – 9.521)</td>
<td>0.644 .422</td>
</tr>
<tr>
<td>Acculturation</td>
<td>1.004 (0.970 – 1.038)</td>
<td>0.043 .835</td>
</tr>
<tr>
<td>Religiousity</td>
<td>1.007 (0.956 – 1.062)</td>
<td>0.076 .783</td>
</tr>
<tr>
<td>Tobacco use inside home</td>
<td>0.604 (0.093 – 3.905)</td>
<td>0.280 .597</td>
</tr>
<tr>
<td>Yes</td>
<td>[Reference]</td>
<td>[Reference]</td>
</tr>
<tr>
<td>Interaction between sex and attitudes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women with positive attitudes</td>
<td>0.298 (0.007 – 11.947)</td>
<td>0.413 .520</td>
</tr>
<tr>
<td>Women with negative attitudes</td>
<td>0.012 (0.000 – 0.394)</td>
<td>6.169 .013*</td>
</tr>
<tr>
<td>Men with positive attitudes</td>
<td>0.529 (0.021 – 13.344)</td>
<td>0.150 .699</td>
</tr>
<tr>
<td>Men with negative attitudes</td>
<td>[Reference]</td>
<td>[Reference]</td>
</tr>
</tbody>
</table>

Abbreviations: AOR, Adjusted Odds Ratio; CI, Confidence Interval; Wald, Wald Chi-square.

* 0.01 ≤ p-value < 0.05.
** 0.001 ≤ p-value < 0.01.
*** p-value < 0.001.
Chapter 3

Number of Serious Attempts to Quit Cigarette Smoking in a Sample of Adult Muslim Smokers in the United States

Journal: Ethnicity and Health
Number of Serious Attempts to Quit Cigarette Smoking in a Sample of Adult Muslim Smokers in the United States

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Abstract

Objective. Guided by the Social Cognitive Theory, we investigated the associations between the number of serious cigarette smoking cessation attempts and cognitive as well as environmental factors in adult Muslim smokers in the United States (US).

Design. This cross-sectional study was based on a convenience sample of adult (≥ 18 years) US Muslim smokers. Data were collected using an on-line survey from November 2016 to March 2017. We conducted unadjusted Poisson regression followed by adjusted multivariable Poisson regression analyses.

Results. One hundred thirty-two eligible smokers completed the questionnaire. Sixty-two smokers (47.0%) seriously attempted to quit cigarette smoking at least once over the past 12 months, half of which reported attempting to quit cigarette smoking without any assistance. Smokers reported more serious cigarette smoking cessation attempts if they 1) had more knowledge about the consequences of cigarette smoking cessation, 2) had more positive attitude regarding quitting, and 3) reported greater religiosity. Additionally, smokers reported fewer serious cigarette smoking cessation attempts if they 1) were employed, 2) affiliated with Sunnah sect, 3) reported better self-assessed health, 4) reported higher perceived value for quitting, and 5) indicated that using tobacco was not allowed inside the home.

Conclusion. Suboptimal utilization of behavioral support and prescription medication while attempting to quit cigarette smoking may indicate inadequate utilization of provider professional assistance in US Muslim smokers. Knowledge of the consequences, more positive attitudes, and greater religiosity can be influential constructs in future interventions that aim to encourage serious cigarette smoking cessation attempts in US Muslim smokers.
**Key words:** Muslims, Cognitive Factors, Environmental Factors, Quitting Smoking, Religiosity, Acculturation.

This study did not receive any grant funding.
**Introduction**

Quitting cigarette smoking is associated with major health benefits, such as improved cardiovascular and respiratory function (Gratziou 2009). A greater number of serious smoking cessation attempts (SSCA), defined as abstaining from cigarette smoking for one day or longer while attempting to quit (Babb 2017), is associated with greater chances of successful cigarette smoking cessation (Chaiton et al. 2016). In 2015, 55.4% of cigarette smokers in the United States (US) had at least one SSCA over the past 12 months, but only 7.4% succeeded in quitting (Babb 2017). Thus, it is suggested that promoting cigarette smoking cessation could be achieved through encouraging more quit attempts (Gilbert et al. 2008). Previous research indicated that it takes a cigarette smoker between 6 and 142 quit attempts to achieve successful cessation (Chaiton et al. 2016). Therefore, investigating number of SSCA is essential to identify factors that promote cigarette smoking cessation. Additionally, investigating number of SSCA provides an indication on smokers’ motivation regarding quitting cigarette smoking (Davila et al. 2009); although they may not be able to quit at a given time. Finally, because quitting cigarette smoking is a gradual process, not an instantaneous action (Chaiton et al. 2016), investigating the factors that associate with the number of SSCA is important for understanding the transition from current smoking to successful smoking cessation.

The number of SSCA can be influenced by several cognitive and environmental factors (Babb 2017), especially in minority groups (Fu et al. 2007). As a minority group in the US, the Muslim population ranges between 3 and 7 million (Kettani 2010; Mohamed 2016), the majority (63%) of whom are foreign-born (Pew Research 2011). In this context, examining SSCA among US Muslims is important because they exhibit elevated cigarette smoking rates (Newport and Himelfarb 2013), which place them at a higher risk of preventable disease and premature death.
compared to the US population. Because the majority of US Muslims are foreign-born (Pew Research 2011), they may have different cognitive and environmental characteristics that affect cigarette smoking cessation than other US citizens. Prior to this research, there was a gap in the literature regarding associations between number of SSCA and psychosocial factors in US Muslim smokers. Thus, the current study investigated the Social and Cognitive Theory (SCT) factors that were associated with number of SSCA in a sample of adult US Muslim smokers.

Although much of the literature using the SCT contrasts those who actually quit smoking with those who did not, the assessment of number of SSCA as an outcome variable permits the measurement of attempting to quit, an important first step in the quitting process. This may help identify important constructs to address in devising future interventions to promote cigarette smoking cessation in this population. Studies investigating factors related to the number of SSCA in other groups demonstrated that higher number of SSCA is associated with higher self-efficacy regarding ability to refrain from smoking (John, Meyer, Rumpf, et al. 2004), perceived social pressure to not smoke due to interacting with nonsmokers (Burns 2009), lower acculturation (Haddad et al. 2012), living in a smoke-free home (Borland et al. 2006), discussing cigarette smoking cessation with physicians (Aveyard et al. 2012), more nicotine dependence (John, Meyer, Hapke, et al. 2004), being male (Ferron et al. 2011), and having a high school education or higher (Ferron et al. 2011).

We used the SCT to investigate the factors associated with number of SSCA (Bandura 1986). The SCT suggests that behavior is based on the interaction among 1) cognitive factors, 2) environmental factors, and 3) behavior. Cognitive factors include 5 constructs (Bandura 1998, 2001a, 2001b, 2004, 2005): 1) knowledge of the consequences (general health benefits) of cigarette smoking cessation, 2) expectations of cigarette smoking cessation, 3) perceived value
of this health impact, 4) **attitudes** (i.e. overall opinion) regarding cigarette smoking cessation, and 5) **self-efficacy** regarding one’s ability to quit smoking. Environmental factors include 3 constructs (Bandura 1998, 2001a): 1) **vicarious learning**, 2) **social norms** surrounding quitting smoking, and 3) **barriers and facilitators** related to quitting smoking. In addition, **acculturation** and **religiosity** are related to **social norms**. Acculturation assesses how assimilated immigrants are with the main culture of their new environment (Hui, Lent, and Miller 2013), whereas religiosity measures the level of compliance of individuals with their own religious beliefs and practices. In sum, due to its inclusion of pertinent psychosocial factors, utilizing the SCT was appropriate for analyzing factors associated with SSCA among US Muslim smokers.

Cognitive factors are important to consider in predicting cigarette smoking cessation behavior. As mentioned above, little research investigated the factors associated with number of SSCA. However, the literature that investigated predictors of making a quit attempts indicated that smokers were more likely to attempt to quit if they 1) thought quitting has positive health consequences (Davila et al. 2009), 2) believed that the positive health consequences of quitting would have a personal impact on them (Vangeli et al. 2011), 3) believed that the positive health consequences were important to them (Rose et al. 1996), 4) had positive views about cigarette smoking cessation (Hyland et al. 2006), and 5) had higher self-efficacy about their ability to quit smoking (Li et al. 2011).

In terms of environmental factors, smokers were more likely to attempt to quit if they 1) had role models, such as family or friends, who quit smoking (Whittaker et al. 2008), 2) believed that smoking was socially rejected (Hyland et al. 2004), 3) had barriers such as nicotine dependence or facilitators such as working in a smoking-free workplace (Farkas et al. 1999),
living in a smoke-free home, as well as receiving medical/behavioral support (Davila et al. 2009). Of note, combining medications and behavioral support is associated with the highest probability of successful cigarette smoking cessation (Stead and Lancaster 2012). Social norms can be key determinants of smoking behavior in Muslims. For example, tobacco use is socially accepted and may promote social interaction in predominantly Muslim countries (Unger et al. 2003). Additionally, individuals’ receptiveness to cigarette smoking cessation campaigns is dependent on their acculturation level (Webb 2008). Further, religiosity is an important factor in cessation attempts (Strawbridge et al. 2001), especially in Muslims (Yong et al. 2013). However, gender specific analyses indicated that weekly attendance of religious services was associated with more likelihood of quitting cigarette smoking only in women (Strawbridge et al. 2001). In sum, environmental factors from the SCT are also important in predicting cigarette smoking cessation behavior.

The current study aimed to study the SCT factors related to number of SSCA in a convenience sample of adult US Muslim smokers. Because use of other tobacco products (e.g., water-pipe) might be sporadic and occasional, no clear definition is available yet in the literature on the definition of serious attempts to quit all types of tobacco products. Hence, this study assessed number of quit attempts for only cigarette smoking. The first objective was to investigate the associations between number of SSCA and cognitive as well as environmental factors. We hypothesized that adult Muslim smokers would have more SSCA if they 1) thought it was associated with positive health consequences, 2) believed that the positive consequences would have a personal impact on their health, 3) thought having these health consequences was important to them, 4) had a positive attitude about quitting smoking, 5) had higher self-efficacy regarding their ability to quit smoking, 6) had a friend or a family member who quit smoking, or
7) thought that quitting smoking was socially accepted. The second objective was to investigate the associations between SSCA and religiosity as well as acculturation. We hypothesized that adult Muslim smokers who exhibited greater religiosity and higher acculturation would have more SSCA. The third objective was to examine the interaction effect of sex and religiosity on number of serious attempts to quit cigarette smoking in a sample of adult US Muslim smokers. We hypothesized that sex would moderate the association between religiosity and number of serious attempts to quit cigarette smoking.

**Methods**

**Design**

The study included a convenience sample of adult (≥ 18 years old) US Muslim smokers. Due to potentially different cigarette smoking cessation behaviors, we excluded 2 smokers with a personal history of lung cancer. The data we used to test the study hypotheses were collected as part of a larger cross-sectional design study from November 2016 to March 2017 (Attarabeen et al. 2018). However, we restricted the analysis to current smokers because different characteristics were expected to influence SSCA between current and former smokers.

**Measures**

The primary variable of interest (i.e., number of SSCA) was assessed using one item that inquired about the number of SSCA during the past 12 months. SSCA is defined as abstaining from smoking for one day or longer as an attempt to quit smoking (Babb 2017). Because only participants who reported current smoking were included in the study, eligible participants were those who 1) smoked a total of at least 100 cigarettes in their entire life, and 2) reported current smoking “some days” or “every day”, consistent with the definition of current smoking in previous research (National Health Interview 2015).
Cognitive factors. Each of the cognitive factors was measured using one item. We measured knowledge through assessing perceived likelihood of reduction in chances of diseases or death as a result of quitting smoking (Flay et al. 1994). We measured outcome expectations by assessing perceived effect of cigarette smoking cessation on personal health (Borland et al. 2010). We measured perceived value by assessing perceived importance of gaining the benefits of cigarette smoking cessation (Shrier et al. 2014). We measured attitudes through evaluating smokers’ overall opinions on cigarette smoking cessation (Hyland et al. 2006). Responses to these four items addressing cognitive factors were assessed on a 5-point ordinal scale as detailed in the larger study (Attarabeen et al. 2018). Finally, we measured self-efficacy using a continuous scale ranging from 0% to 100% (Perkins et al. 2012).

Environmental factors. We measured vicarious learning through assessing whether smokers knew of any former smoker among their first-degree family members and friends (Kandel et al. 2004). We measured social norms through assessing perceived acceptability of quitting smoking among first-degree family and friends (Panday et al. 2005). We measured acculturation using the Brief Acculturation Scale (Meredith et al. 2000) whereas religiosity was measured using the Duke University Religion Index (Koenig and Büssing 2010). Responses to vicarious learning were assessed using a binary scale (No/Yes) whereas responses to social norms were assessed using a 5-point ordinal scale. Responses to acculturation and religiosity were normalized to range from zero to 100 as explained in the original study (Attarabeen et al. 2018).

In terms of barriers and facilitators, we measured nicotine dependence using the Heavy Smoking Index, a 2-item scale with high concordance with Fagerström Nicotine Dependence Scale (Chabrol et al. 2005). Discussing cigarette smoking cessation with a physician anytime...
over the past 12 months (No/Yes) and rules of using tobacco inside the home (Not allowed/Allowed) were assessed using one item for each as described previously (Attarabeen et al. 2018). Finally, use of cigarette smoking cessation techniques was measured using a multiple-answer item. Responses included 1) nicotine replacement, 2) prescription medications, 3) behavioral support, and 4) no pharmaceutical/behavioral assistance. Lastly, Demographic Characteristics, including sex, age, race, ethnicity, marital status, education, employment status, income, health insurance status, and general well-being were measured using one item for each as explained previously (Attarabeen et al. 2018).

**Statistical Analysis**

We conducted descriptive analyses to identify the distribution of categorical variables with regard to SSCA. Due to lack of sufficient distribution, some variables including sect affiliation were collapsed into binary variables as explained in the original study (Attarabeen et al. 2018). In order to examine associations with the primary variable of interest (i.e., number of SSCA), cognitive and environmental variables as well as demographic variables were investigated using 2 Poisson regression models, individually in an unadjusted model and collectively in an adjusted model. Secondary independent samples t-test was conducted to identify whether men and women varied in religiosity. Finally, a Poisson regression analysis was conducted to examine the potential interaction between sex of respondent and religiosity on number of SSCA.

**Results**

Because this research study was part of a larger study (Attarabeen et al. 2018), we had 370 responses in total. However, only 132 participants met the eligibility criteria for this study (4 participants younger than 18 years old, 61 participants from outside the US, 25 participants did
not affiliate with Islam, 8 participants had a personal history of lung cancer, one duplicate record, and 139 did not report current cigarette smoking). Eligible participants completed the questionnaire in English (n=91), Arabic (n=40), and Farsi (n=1). Participants’ age ranged from 19 to 68, with a mean age of 37. Only one participant was Hispanic or Latino/a. The majority (58.9%) of participants were foreign-born. Only 47.0% of the sample of smokers attempted to quit smoking seriously at least once over the past 12 months. However, this was not statistically significant from 55.4% (Babb 2017), which was the most recent rate of attempting to quit smoking among US smokers ($t(131) = -1.933$, $p = .055$).

Number of quit attempts ranged from zero to 30, with a mean value of 1.56. Out of 62 smokers in the sample with at least one SSCA, only 3 smokers reported using both prescription medications and counseling to aid with SSCA. Additionally, 24 smokers reported using nicotine replacement, 31 smokers reported not using any form of assistance, and the rest reported using either prescription medications or counseling. Variables that were significantly associated with number of SSCA in the unadjusted Poisson regression model are presented in Table 1.

In adjusted Poisson regression analyses, we observed significant associations between some SCT factors and number of SSCA (Table 2). With regard to cognitive factors, knowledge was positively associated with SSCA; those who perceived higher reduction in chances of diseases or death as a result of quitting smoking had 41% higher number of SSCA (adjusted incident rate ratio (AIIR) = 1.405; 95% confidence interval (CI) = 1.098 – 1.798). Similarly, smokers who had more positive views on cigarette smoking cessation had 51% higher number of SSCA compared to those with negative views on cigarette smoking cessation (AIIR = 1.513; 95% CI = 1.122; 2.041). However, those with higher perceived value of cigarette smoking cessation had lower number of SSCA (AIIR = 0.744; 95% CI: 0.562-0.985).
In terms of environmental factors, religiosity and tobacco use inside the home were significantly associated with SSCA. Higher scores on religiosity scale were associated with a higher number of SSCA (AIIR = 1.011; 95% CI = 1.002, 1.020). However, those who lived in homes where tobacco use was not allowed had lower number of SSCA compared to smokers who lived in homes where tobacco use was allowed (AIIR = 0.473; 95% CI = 0.299 – 0.750).

Among the demographic factors, employment status, sect affiliation, and general well-being were associated with SSCA. Employed individuals had 53% lower SSCA compared to those who were not employed (AIIR = 0.467; 95% CI = 0.299 – 0.727). Smokers who reported affiliation with Sunnah sect had 51% lower number of SSCA compared to smokers who did not affiliate with Sunnah sect (AIIR = 0.485; 95% CI = 0.318 – 0.740). Finally, smokers who reported better perceived well-being had lower number of SSCA (AIIR = 0.986; 95% CI = 0.977 – 0.966).

Secondary analyses demonstrated that men scored higher scores on religiosity (Mean (M) = 54.9, Standard deviation (SD) = 33.9) compared to women (M = 19.2, SD=23.8), t(130) = -6.489, p < .001. However, the interaction between sex of respondent and religiosity in association with SSCA was not statistically significant (p = .932).

**Discussion**

The current study investigated the SCT factors related to number of SSCA in a sample of adult Muslim smokers in the US. The majority of participants (62.9%) were men, which is typical, considering the higher likelihood of cigarette smoking in Muslim men compared to Muslim women (Sayeed 2011). In our study sample, 47% of smokers attempted to quit at least
once during the 12 months period prior to data collection. This is slightly lower than the national rate of quit attempts, which was 55.4% in 2015 (Babb 2017).

Three cognitive factors from the SCT were associated with number of SSCA. These were knowledge of the consequences of cigarette smoking cessation, attitudes regarding quitting, and perceived value for quitting. Two environmental factors from the SCT were associated with number of SSCA. These were religiosity and rules about using tobacco inside the home.

In terms of cognitive factors, the associations between SSCA and knowledge of the consequences as well as attitudes were consistent with our hypotheses and with previous research (Davila et al. 2009; Hyland et al. 2006). These findings verify the importance of cognitive beliefs in understanding decisions related to SSCA. These constructs might be considered important factors in developing and implementing interventions aimed at this population, for example, through patient education and awareness campaigns aimed at increasing SSCA. Additionally, if based on the SCT, such future interventions may educate smokers about techniques to stop smoking, increase their awareness on how to seek medical or behavioral assistance, or direct them to social support groups where they can meet former smokers who can serve as role models for current smokers to quit smoking. Considering that the majority of the study participants were foreign-born (58.9%), their education in source countries before immigrating to the US may not have equipped them properly with sufficient knowledge about smoking and its consequences. This highlights the importance of awareness and education, which can be provided through effective patient-provider communication during medical visits.

Contrary to our hypothesis and to the SCT, smokers who reported a higher perceived value of cigarette smoking cessation had fewer SSCA. One explanation might be that quit attempts last longer in smokers with higher perceived value of cigarette smoking cessation, and
therefore, a fewer number of quit episodes are attempted during a 12-month period. In order to further investigate this relation, it is recommended that future studies measure the duration of abstinence from smoking during smokers’ attempts to quit.

In terms of environmental factors, the role of religiosity in promoting cigarette smoking cessation was documented in previous research on Muslim smokers outside the US (Yong et al. 2013) as well as in this study. The role of religion and religious teachings may have discouraged smokers from continuing to smoke. Higher religiosity may have been observed as higher compliance with religious rulings related to abstaining from harmful substances (Hamid 2017). Therefore, religion-based messages might hold promise for encouraging SSCA in US Muslim smokers. However, because men scored higher scores on religiosity compared to women, this finding should be interpreted with caution. Even though the interaction between religiosity and sex of respondent in associating with number of SSCA was not statistically significant, researchers should bear in mind that men and women may require different approaches if religion-based interventions are implemented for US Muslim smokers. We suggest that future research examine the potential moderating effect of sex on religiosity. This suggestion is based on the substantially different scores between men and women on the religiosity scale.

One of the unexpected findings in this study was the direction of association between rules about tobacco use inside the home and number of SSCA. Contrary to previous research linking no smoking in the home to more smoking cessation attempts (Farkas et al. 1999; Borland et al. 2006), our findings demonstrated that smokers who reported living in smoke-free homes had fewer SSCA. The finding might indicate that smokers who live in smoke-free homes believe that because they do not harm their family members by exposing them to secondary smoking, there is less need to quit, or 2) because they do not act as negative role models to their family
members in the home, there is less motivation to quit. Thus, not smoking at home may have led smokers to think of smoking less negatively compared to smokers who do smoke at home. Another interpretation might be that smokers who live in smoking friendly homes perceive greater health risk from their smoking, possibly combined with the smoking of others, and therefore, they exert more effort to quit.

It has been reported that discussing cigarette smoking cessation with health care providers facilitates cigarette smoking cessation attempts (Stead and Lancaster 2012). However, 27 smokers (20.5%) in the current study reported that no health care providers had asked them about quitting smoking over the past 12 months, either because they did not see a health care provider during the 12 months period before data collection, or because they failed to discuss cigarette smoking cessation during health care encounters. In addition, although combination therapy (prescription plus counseling) has shown the highest effectiveness rates for successful cigarette smoking cessation (Stead and Lancaster 2012), only 3 smokers reported using both techniques to help with quit attempts. In sum, limited assistance from health care providers might be a barrier to curbing smoking rates in US Muslim smokers.

We observed that some demographic factors were also associated with number of SSCA. Employed individuals had lower SSCA compared to those who were not employed. This could be interpreted as employed individuals choosing to not endure withdrawal symptoms due to work-related stress or because employed smokers do not have the time to invest in seeking medical or behavioral assistance to quit smoking. Additionally, because individuals who work in smoke-free environments are more likely to be in cessation for at least 6 months when they attempt to quit (Farkas et al. 1999), perhaps employed individuals in our sample worked in smoke-free workplaces and therefore needed fewer attempts during a 12 months period. More
research is needed to address this relation in the future. The association of Sunnah sect affiliation with number of SSCA was not documented in the literature. This indicates the importance of religious factors in cigarette smoking cessation behavior. This association can be interpreted as less receptiveness to cigarette smoking cessation campaigns among US Muslim smokers who affiliate with the Sunnah sect. Another interpretation might be related to higher rates of current tobacco use among individuals who affiliate with other sects compared to Sunnah sect (Attarabeen et al. 2018). So smoking rates in other sects might be simply regressing toward the mean, evidently by individuals having more quit attempts. Finally, smokers with worse self-assessed health reported more SSCA. Although causation cannot be implied, it is possible that those with lower self-assessed health may be acting to improve their health status by attempting to quit smoking. In sum, these three demographic factors were associated with the number of SSCA.

Contrasting Table 1 with Table 2, directions of associations between number of SSCA and affiliated sect as well as perceived value were reversed. In the unadjusted model, both perceived value and Sunnah sect were positively associated with SSCA, but these associations were reversed once variance associated with all other variables was accounted for in the adjusted model. This effect may represent a type of suppression effect that resulted from the linear combinations of variables that were entered into the regression equation (Friedman and Wall 2005). To examine this observation further, analyses were conducted by sequentially adding each independent variable into the unadjusted regression equation in order to identify the root source of this potential suppression effect. During these sequential analyses, we monitored the incident rate ratios (IRR) for associations between number of SSCA and affiliated sect as well as perceived value. The majority of independent variables showed a gradual reduction in the value
of IRR when added to the adjusted model, eventually causing the IRR to fall below 1.0, and therefore reverse the direction of the associations. Thus, not just a single independent variable, but the majority of independent variables accounted for the flip in the direction of the associations. Our interpretation to this finding is that this statistical phenomenon was responsible for the altered direction of association between perceived value and number of SSCA discussed above, which resulted in a finding contrary to our hypothesis. In this regard, our failure to measure the duration of quit attempts emerged as an important factor in producing a result that was contrary to expectations. Therefore, not measuring duration of quit attempts may have partially distorted our results and the resulting adjusted model may be displaying confounding by other variables. With regard to affiliated sect, we believe that dichotomizing the variable during analyses is related to the lack of diversity of sects within our sampling distribution. If larger samples of various Muslim sects were sampled in future research, the relation between sect and number of SSCA could be addressed better among US Muslim smokers.

The current study had some limitations. First, using convenience sampling techniques limits the generalizability of these results to all adult US Muslim smokers. Second, because participation was voluntary and data were collected online, response rate could not be enumerated and consequently, rates of non-response remain unknown. Third, the cross-sectional design hinders our ability to investigate causal relations for any of the observed associations. Fourth, rules of tobacco use at the workplace were not measured. This may have limited our capability to fully understand the association observed between employment status and number of SSCA. Finally, the limited number of participants may have lowered the statistical power needed to detect all associations, particularly those that involve moderating effects. Nevertheless, data was collected from smokers in 23 states in the US, so the findings are not confined to a
particular region of the country. Additionally, this was the first study to investigate the associations between SSCA and cognitive as well as environmental factors among adult US Muslim smokers using the SCT. Researchers who address cigarette smoking cessation in adult US Muslim smokers should bear in mind two important implications for this study. First, more SSCA is associated with more knowledge of the consequences, more positive attitudes, and greater religiosity, all of which can be used to build future cigarette smoking cessation interventions. Second, inadequate utilization of provider professional assistance in US Muslim smokers may exacerbate the problems associated with elevated rates of smoking in this population.
Acknowledgement

Thanks to Omar Abu Abed, Simin Falsafi, Ali Fakhimi, and Maleeha Hassan for assisting in translating the questionnaire.

Key messages

(1) Among adult Muslim smokers in the United States (US), more SSCA is associated with higher knowledge of the consequences, more positive attitudes, and greater religiosity. Future interventions may utilize all these factors to design more effective cigarette smoking cessation interventions.

(2) Inadequate utilization of provider professional assistance with regard to cigarette smoking cessation may exacerbate the problem of elevated rates of smoking among US Muslims.

Disclosure statement

Authors declare no conflicts of interest.
References


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Table 1. Descriptive Statistics, Unadjusted Incident Rate Ratio, 95% Confidence Interval, Standard Error, and Significance Level from Poisson Regression on Number of Serious Cigarette Smoking Cessation Attempts. Muslim Adult (≥ 18 years) Smokers in the United States

<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
<th>UIRR (95% CI)</th>
<th>SE</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>83</td>
<td>2.12</td>
<td>3.76</td>
<td>3.463 (1.756 - 6.832)</td>
<td>1.200</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Female</td>
<td>49</td>
<td>0.61</td>
<td>1.24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>93</td>
<td>1.43</td>
<td>3.48</td>
<td>0.764 (0.414 – 1.411)</td>
<td>0.239</td>
<td>.390</td>
</tr>
<tr>
<td>Not employed</td>
<td>39</td>
<td>1.87</td>
<td>2.19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sect</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Sunnah</td>
<td>51</td>
<td>2.31</td>
<td>4.46</td>
<td>2.130 (1.125 – 4.031)</td>
<td>0.693</td>
<td>.020</td>
</tr>
<tr>
<td>Something else</td>
<td>81</td>
<td>1.09</td>
<td>1.81</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Insurance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>14</td>
<td>2.21</td>
<td>2.01</td>
<td>1.493 (0.814 – 2.739)</td>
<td>0.462</td>
<td>.195</td>
</tr>
<tr>
<td>Yes</td>
<td>118</td>
<td>1.48</td>
<td>3.26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
<td>0.866 (0.766 – 0.979)</td>
<td>0.054</td>
<td>.021</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td>0.970 (0.951 – 0.990)</td>
<td>0.010</td>
<td>.004</td>
</tr>
<tr>
<td>Self-assessed Health</td>
<td></td>
<td></td>
<td></td>
<td>0.988 (0.973 – 1.003)</td>
<td>0.008</td>
<td>.116</td>
</tr>
<tr>
<td>Cognitive Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td></td>
<td>1.987 (1.681 – 2.348)</td>
<td>0.169</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Outcome expectations</td>
<td></td>
<td></td>
<td></td>
<td>1.876 (1.554 – 2.265)</td>
<td>0.180</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Attitudes</td>
<td></td>
<td></td>
<td></td>
<td>2.243 (1.865 – 2.697)</td>
<td>0.211</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Perceived value</td>
<td></td>
<td></td>
<td></td>
<td>1.708 (1.112 – 2.622)</td>
<td>0.374</td>
<td>.014</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td></td>
<td></td>
<td></td>
<td>1.025 (1.013 – 1.037)</td>
<td>0.006</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Environmental Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vicarious learning – Family</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>91</td>
<td>1.33</td>
<td>3.48</td>
<td>0.641 (0.343 – 1.201)</td>
<td>0.205</td>
<td>.165</td>
</tr>
<tr>
<td>Yes</td>
<td>41</td>
<td>2.07</td>
<td>2.21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vicarious learning – Friends</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>95</td>
<td>1.05</td>
<td>1.72</td>
<td>0.367 (0.191 – 0.708)</td>
<td>0.123</td>
<td>.003</td>
</tr>
<tr>
<td>Yes</td>
<td>37</td>
<td>2.86</td>
<td>5.11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social norms - Family</td>
<td></td>
<td></td>
<td></td>
<td>6.177 (3.159 – 12.077)</td>
<td>2.113</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Social norms - Friends</td>
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<td></td>
<td></td>
<td>2.869 (1.783 – 4.617)</td>
<td>0.696</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Acculturation</td>
<td></td>
<td></td>
<td></td>
<td>0.988 (0.983 – 0.994)</td>
<td>0.003</td>
<td>.001</td>
</tr>
<tr>
<td>Religiosity</td>
<td></td>
<td></td>
<td></td>
<td>1.017 (1.010 – 1.024)</td>
<td>0.004</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Nicotine Dependence</td>
<td></td>
<td></td>
<td></td>
<td>1.458 (1.119 – 1.899)</td>
<td>0.197</td>
<td>.005</td>
</tr>
<tr>
<td>Tobacco use inside home</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Discuss cigarette smoking cessation with doctor</td>
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<td>1.15</td>
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Abbreviations: N, Number of participants included in the analysis; Mean, Mean of the Number of SSCA across Categorical Variables; S.D., Standard Deviation of the Number of SSCA; UIRR, Unadjusted Incident Rate Ratio; CI, Confidence Interval; SE, Standard Error; Sig., Statistically Significant.
<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>AIRR (95% CI)</th>
<th>SE</th>
<th>p-value</th>
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<td>Sex</td>
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<td>Male</td>
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<tr>
<td>Employed</td>
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<tr>
<td>Sect</td>
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<tr>
<td>Sunnah</td>
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<td>Income</td>
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<td>No</td>
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Abbreviations: AIRR, Adjusted Incident Rate Ratio, CI, Confidence Interval, SE, Standard Error, Sig., Statistically Significant
Chapter Four

Interest in Lung Screening among a Sample of Adult Muslims in the United States

Journal of Community Health
Interest in Lung Screening among a Sample of Adult Muslims in the United States

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Authors declare no conflicts of interest.

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Abstract

Objective. Muslims in the United States (US) exhibit high rates of tobacco use, which make them more vulnerable to lung cancer. The current study investigated the associations between Social Cognitive Theory factors and being interested in being screened for lung cancer in a sample of adult Muslims in the US.

Methods. We examined a convenience sample of adult (≥ 18 years) Muslims who resided in the US and had no personal history of lung cancer. A cross-sectional on-line survey was used to collect data from November 2016 to March 2017. Binomial logistic regression analyses were conducted to answer the research question.

Results. Two hundred seventy-one eligible participants from 30 states completed the questionnaire, of which 59.9% expressed an interest in being screened for lung cancer. Individuals were more likely to express an interest in lung cancer screening if they had 1) more positive views about lung screening, 2) higher perceived value of screening, and 3) greater self-efficacy with regard to ability to undergo lung screening.

Conclusion. Cognitive factors can influence interest in lung screening. Lack of adherence to lung screening guidelines was apparent in our sample. Improving attitudes to lung screening, increasing perceived value of screening, and boosting self-efficacy regarding ability to complete lung screening could be important factors to consider in devising future interventions aimed at increasing interest in lung screening in adult US Muslims.

Key words: Muslims, Lung Screening, Cognitive Factors, Environmental Factors, Religiosity, Acculturation.
Introduction

Lung cancer is the leading cause of cancer-related death and the second most commonly diagnosed cancer in the United States (US) [1]. It is estimated that 222,500 new cases and 155,870 deaths will be attributed to lung cancer in 2017 in the US [2]. In fact, mortality attributed to lung cancer in the US exceeds the mortality attributed to colon, breast, and prostate cancers combined [2]. In terms of etiology, smoking is the leading cause of lung cancer [3]. Even though lung screening with low-dose computed tomography (LDCT) can result in potential harm, such as risk for false-positive results, preventive screening with LDCT is associated with 16% reduction in lung cancer mortality among individuals who are at risk of lung cancer [4]. Therefore, the US Preventive Services Task Force (USPSTF) recommends annual preventive LDCT screening for current and former smokers (unless they quit smoking more than 15 years ago) aged 55 to 80 years, and who have at least 30 pack-year smoking history [5]. Pack-year is calculated by multiplying packs smoked per day by years of smoking. It is estimated that 7 million individuals in the US are eligible for LDCT [6]. However, screening rates have only ranged from 3.3% to 3.9% among eligible individuals over the past few years [6].

Individuals from minority groups exhibit lower survival rates due to lung cancer and more advanced stages at diagnosis compared with the general population [7, 8]. As a minority group in the US, the Muslim population ranges between 3 and 7 million [9, 10], and comprises one of the fastest growing minorities in the US because of high fertility rate and increased immigration [11]. Because they exhibit high rates of tobacco use [12, 13], US Muslims might be at a higher risk for lung cancer and eligibility for lung screening.

With the exception of lung cancer incidence rate in Turkey (63.9 per 100,000) [14], incidence rates of lung cancer in most Muslim-majority countries are comparable or less than the
incidence rate in of lung cancer in the US (55.8 per 100,000) [15]. However, most Muslim-majority countries are developing countries, where poverty and poor health care systems can be associated with under-diagnosis of diseases including lung cancer. Additionally, due to low life-expectancy in developing countries [16], diseases that usually associate with aging, such as lung cancer, may be rarely reported. In contrast [17], minorities in the US hold certain beliefs that interfere with prevention and early diagnosis of lung cancer [18, 19] and perceive more barriers related to performing lung screening [20]. For example, US Muslims are reported to seek alternative medicine such as spiritual healing in lieu of clinical care, or seek assistance and support from community leaders and family members instead of health care professionals [21]. Therefore, their readiness to engage in preventive health measures, such as lung screening, is expected to be worse compared with the rest of the US population [21].

Screening for lung cancer is a relatively new recommendation [5]. Hence, there is limited research on psychosocial factors that promote or interfere with lung cancer screening with LDCT, including research on US Muslims. The available literature has shown that higher perceived personal benefits of screening was associated with interest in being screened for lung cancer [22, 23]. In addition, interest in lung screening might be influenced by facilitators or barriers. Facilitators included holding positive views about screening [24-26], discussing lung screening with physicians [23, 27-30] and having health insurance that covers screening expenses [20, 29, 30]. Barriers, however, included unawareness of lung screening guidelines [28, 29, 31], fear of potential negative consequences of screening [20, 22, 27, 29], or holding fatalistic beliefs about lung cancer, especially when individuals are unfamiliar with screening efficacy, safety, or eligibility [20, 24, 25, 32]. In terms of demographic characteristics, women, elderly people, current smokers, and individuals with lower socioeconomic status were less
interested in being screened for lung cancer [33]. However, US Muslim men exhibit elevated rates of tobacco use compared to US Muslim women [17]. Therefore, US Muslim men might be at a higher risk for lung cancer; therefore, more US Muslim men than women might be eligible for lung screening. Consequently, prior research is scant on utilization of a comprehensive theoretical framework, such as the Social Cognitive Theory (SCT) [34], to investigate the factors that were associated with being interested in lung screening among adult US Muslims. Understanding these associations is essential in guiding efforts to improve adherence to preventive lung screening guidelines among eligible individuals.

To overcome the paucity of research on psychosocial factors that influence decisions to engage in lung cancer screening, the current research project investigated the association of psychosocial factors with being interested in lung screening in a sample of adult US Muslims using the SCT as a theoretical framework [34]. This theory proposes that behavior is one of 3 components that interact during the decision-making process. Thus, 1) cognitive and 2) environmental factors influence 3) behavioral decisions. According to the theory, cognitive factors in terms of lung screening include 5 constructs: knowledge about the screening, outcome expectations (i.e., perceived personal impact) of the behavior, perceived value of the behavioral consequences of the behavior, personal overall views (i.e., attitudes) regarding the behavior, and self-efficacy regarding ability to complete the behavior [35, 36]. The model also includes 3 constructs in terms of environmental factors: vicarious learning (i.e., learning by imitation), perceived social norms, and barriers and facilitators to completing a particular behavior [34-36].

Religiosity and acculturation are also environmental factors that may influence individuals’ adoption of social norms. Religiosity refers to an individuals’ degree of adherence to
the beliefs, doctrines, and practices of a particular religion [37]. Religiosity can influence social norms as it measures the degree of compliance between individual religious attitudes and teachings and norms of the religion in which he/she believes. Acculturation measures the level of compliance with the host cultural environment [38]. Thus, religiosity and acculturation can influence social norms, and therefore, influence behavior. Because the majority (63%) of US Muslims are foreign-born [39], they may have distinct cognitive (e.g., beliefs) and environmental (e.g., social norms) factors than other Americans. Therefore, we believe that the SCT was ideal to utilize in this study due to its inclusion of cognitive and environmental factors that might be associated with interest in lung screening.

Lung screening was introduced as a recommended preventive measure only in 2014 [5]. However, the current literature that examines the factors associated with interest in preventive lung screening in the US Muslim population is scant. Because of the scarcity in research investigating the associations between interest in lung screening and cognitive as well as environmental factors in adult US Muslims, we examined lung screening based on SCT factors known to influence screening for other types of cancer. With regard to knowledge and perceived value, individuals are more likely to complete colorectal cancer screening if they believe that colorectal cancer screening has positive consequences [40], and that prevention of colorectal cancer is important to them [41]. In terms of outcome expectations and attitudes, individuals are more likely to complete lung cancer screening if they believe that lung screening has a positive personal impact on their health [22, 23], and if they hold positive views regarding lung screening [24-26]. With regard to self-efficacy, individuals are more likely to complete breast cancer screening if they have confidence in their ability to undergo the breast cancer screening procedures [42].
In terms of **vicarious learning**, individuals are more likely to undergo cervical cancer screening if their friends and family members have done so [43]. With regard to **perceived social norms**, individuals are more likely to undergo colorectal cancer screening if it is culturally accepted, especially in terms of what friends and family members think [44]. Additionally, religiosity may promote positive health practices, including general cancer screening [45]. Further, immigrants with lower acculturation (less compliance with US main culture) are less likely to report having cervical cancer screening compared to immigrants who exhibit higher acculturation [46]. Furthermore, individuals can be more likely to undergo lung cancer screening if they have health insurance that covers the cost of screening [20, 29, 30], and if they discuss lung screening with health care providers [23, 27-30]. Finally, although men are more likely than women to use tobacco,[47] women tend to report higher perceived risk for consequences of tobacco use,[48] making them more likely to have interest in lung screening.[49, 50] In sum, several demographic, cognitive and environmental factors influence the likelihood of completing cancer screening, but none of the previous studies used the SCT to examine screening for lung cancer.

The current study aimed to examine the SCT factors that are associated with interest in lung screening in a sample of adult Muslims in the US. The first objective was to investigate the associations between SCT factors and interest in lung screening in a sample of adult US Muslims. We hypothesized that participants of this study would be more likely to have interest in lung screening if they thought that screening was associated with positive consequences, if they thought they would gain health benefits due to lung screening, if they believed that the health benefits were important to them, if they had positive views about lung screening, if they were confident about their ability to have lung screening, if any of their friends or family members had
had lung screening, or if they believed that lung screening was culturally accepted. The second objective was to further address the impact of social norms by investigating the associations between interest in lung screening and religiosity as well as acculturation. We hypothesized that participants would be more likely to have an interest in lung screening if they exhibited greater religiosity and higher acculturation. The last objective was to examine the interaction effect of sex and tobacco use history on interest in lung screening. We hypothesized that sex would moderate the association between tobacco use status and interest in lung screening such that only women who report current tobacco use would be more interested in lung screening.

Methods

Design

We followed convenience sampling procedures to recruit participants. Eligibility criteria included adult (≥18 years old) Muslims in the US. However, we excluded 8 participants with a personal history of lung cancer because we believed they may have had lung screening at least once as part of lung cancer management, which made them a fundamentally different group compared to the general population. The data we used in this research study was collected November 2016 through March 2017 as part of a larger cross-sectional design study. Procedures were previously described [17].

Measures

The primary variable of interest (i.e., interest in lung screening) was assessed using one item that inquired about whether participants would be interested in being screened for lung cancer if it was made available to them for free [50]. In terms of cognitive factors, knowledge of lung cancer screening was measured using three items that assessed efficacy, safety, and eligibility of screening. The answers consistent with the state-of-science were summed to a final
knowledge scale (0=least knowledge – 3=most knowledge). This method of assessing knowledge is consistent with previous research [51]. **Outcome expectations** were measured by assessing perceived impact of lung screening on the respondent’s personal health [52]. **Perceived value** was measured by assessing participants’ perceived importance of the screening consequences [53]. We assessed overall opinions about lung screening in order to measure **Attitudes** [54]. Five-point ordinal scales were used to assess responses to each of these 4 constructs as explained previously [17]. Finally, using a continuous scale (0% – 100%), we measured participants’ confidence in their ability to undergo lung screening in order to assess **self-efficacy** [55].

In terms of environmental factors, 2 items measured **vicarious learning** through assessing whether any first-degree family members or friends ever had undergone lung screening [56]. Additionally, 2 items measured **social norms** through assessing perceived appropriateness of lung screening among (1) first-degree family members and (2) friends [57]. Responses to social norms items were assessed using a 5-point ordinal scale, and then transformed into a 3-point ordinal scale. We used the Brief Acculturation Scale [58] and the Duke University Religion Index [59] to measure acculturation and religiosity, respectively. During analysis, however, overall scores for these 2 constructs were normalized to range from zero to 100. With regard to **barriers and facilitators**, we used one item to assess whether participants discussed lung screening with their physicians anytime during the past 12 months [60]. Lung screening awareness was measured using one item that assessed whether participants ever heard of “low-dose computer tomography” [61]. Finally, the demographic characteristics were assessed as described previously [17].
**Statistical Analysis**

The bivariate associations between the primary variable of interest (i.e., interest in lung screening) and SCT variables (i.e., cognitive and environmental factors) were individually examined using unadjusted binomial logistic regression analyses. The variables that demonstrated modest significance ($p \leq 0.1$) in the bivariate analyses were included in an adjusted binomial logistic regression model. Consistent with previous research investigating factors that are associated with interest in lung screening [50], all variables were entered in the model in one step. Finally, because US Muslim men exhibit elevated rates of tobacco use compared to US Muslim women [17], we conducted a binary logistic regression model to examine the interaction effect of sex and tobacco use history on interest in lung screening. For this purpose, tobacco use history was dichotomized into 2 categories: 1) never used tobacco, and 2) currently or formerly used tobacco.

**Results**

Three hundred seventy participants completed the questionnaire, of which 98 participants did not meet the eligibility criteria (4 participants younger than 18 years old, 61 participants from outside the US, 25 participants did not affiliate with Islam, and 8 participants had a personal history of lung cancer). One duplicate record was identified. Eligible participants (n=271) completed the questionnaire in English (n=180), Arabic (n=88), and Farsi (n=2), and Urdu (n=1). Due to missing data, however, the logistic model was conducted using data from only 262 participants. Respondents’ age ranged from 19 to 70 (median age = 32). Three participants were Hispanic or Latino/a. The majority of participants were foreign-born (60.2%). In terms of tobacco use, 64.2% of participants reported being either former or current tobacco users. More
than half of the sample (53.4%) were not aware of LDCT screening, yet the majority of participants (59.9%) were interested in completing lung screening.

Based on age and smoking history, only 16 participants (5.9%) were eligible for LDCT screening. Only one of them was asked by their health care provider about lung screening during the 12 months prior to data collection. Additionally, none of them had completed screening at the time of data collection. Chi-square analysis demonstrated that there was no significant association between eligibility for screening and interest in lung screening. The SCT variables as well as the demographic variables that were significantly related to interest in lung screening (11 variables) in bivariate analyses are presented in Table 1. Results from the adjusted binary logistic regression model (Table 2) demonstrated that the likelihood of being interested in completing lung screening was higher in individuals with more positive views about lung screening, higher perceived value of the consequences of screening, and greater self-efficacy with regard to ability to undergo lung screening. Finally, results of binary logistic regression analysis that addressed the interaction effect between sex of respondent and tobacco use history on interest in lung screening demonstrated that the interaction was not statistically significant ($p = .455$).

Discussion

This study aimed to investigate the associations between SCT factors and interest in being screened for lung cancer in a sample of adult US Muslims. Due to the important association between preventive cancer screening and religiosity and acculturation [45, 46], we also investigated the associations between interest in being screened for lung cancer and religiosity as well as acculturation. More than half of respondents have never heard of LDCT lung screening, though we mentioned in the questionnaire other name by which the screening test is known. This may indicate low health literacy among participants, which may partially
explain why only 59.9% were interested in being screened for lung cancer even if it were made available to them.

Even though 16 participants in our sample were eligible to be screened based on age and smoking history, none of them had undergone lung screening, which indicated that this preventive health measure was not widely being utilized by participants in the study sample. One possible explanation for this finding might be lack of effective patient-provider communication, as only one out of those 16 individuals was asked by their health care provider about lung screening. Another explanation might be that physicians 1) are not aware of the lung screening guidelines, or 2) are still reluctant to endorse such a relatively new recommendation. Thus, more physicians will need to be encouraged to adopt the practice of recommending lung screening once it is more widely used by leading health care institutions. Our last interpretation is that physicians might give their attention to medical issues they believe have higher priority, such as smoking cessation. Therefore, they might spend the time during health care encounters assisting smokers to quit, rather than convincing them to undergo lung screening. This interpretation is supported by a finding from another study on US Muslim smokers, in which the majority (79.5%) of smokers reported discussing smoking cessation with their health care providers [62]. It is noteworthy that 12 out of those 16 screening-eligible participants were men, which can be explained by higher rates of tobacco use in US Muslim men compared to US Muslim women.

Our results revealed that participants’ attitudes on lung screening, perceived value of the screening consequences, and self-efficacy regarding ability to complete screening significantly influenced their interest in undergoing lung screening. The direction of association for these factors with screening was consistent with previous research [24-26, 41, 42]. This emphasizes the key influence of individuals’ cognitive factors on interest in lung screening in US Muslims.
Future research aiming to increase lung screening rates among eligible individuals may elect to manipulate these cognitive factors, perhaps by educating patients to 1) enhance the perceived value of screening benefits, 2) modify their personal views about screening, and 3) reduce the impact of perceived barriers in order to boost individuals’ self-efficacy.

The relative lack of association between interest in being screened for lung cancer and any environmental factors was a noteworthy observation. This finding, however, was not in line with previous research findings regarding other types of cancer. In terms of screening for breast and cervical cancers for instance, previous research has cited cultural and religion-related factors to influence screening rates for US Muslims compared to other groups comprising the US population [63, 64]. Therefore, the relative lack of association between environmental factors and interest in lung screening indicates that participants may have thought of lung screening as a personal decision to make after consulting with health care providers, and therefore, social environment had little or no influence on this decision. This observation aligns with the theoretical foundations of certain individual health behavior theories, such as the Health Belief Model [65], that suggests that preventive health care-related decisions (i.e., uptake of preventive health services) are influenced exclusively by cognitive factors such as perceived benefits and self-efficacy. Another interpretation might be related to the relative recency of lung screening guidelines [5] and low screening rate among eligible individuals [6], which results in lack of role models from whom individuals can vicariously learn the behavior.

The association of knowledge with interest in lung screening in the unadjusted binary logistic regression model was noteworthy. The direction of association was contrary to what we expected based on the SCT, as individuals with more knowledge about lung screening reported being less interested in undergoing lung screening. The unexpected direction of association
might be related to the method knowledge was measured in this study. The answers consistent with the state-of-science for the 3 items that assessed knowledge happened to be in the negative. Therefore, some individuals may have scored higher on the knowledge scale due to their pessimistic views or fatalistic attitudes about lung screening, not because of their true knowledge about it. Another possible explanation for this finding is that individuals who were knowledgeable of lung screening were also aware of potential harm that can be associated with it, such as risk of false-positive results [4]. Worrying about such risks may have deterred individuals from wanting to screen, and therefore, made them hold fatalistic beliefs about lung cancer. Other studies also cited fatalism and worry about negative consequences as potential barriers to lung screening [20, 24, 25, 32]. Nevertheless, when we adjusted for the effect of other cognitive and environmental factors in the logistic regression model, the association between interest in lung screening and knowledge was no longer significant. This may indicate that other factors, such as overall views about the screening and perceived value of the consequences of screening, are more influential in the decision-making process regarding undergoing screening than knowledge of lung cancer screening.

The current study has certain limitations. First, recruitment was conducted online and it was voluntary. Therefore, we are not able to estimate the number of individuals who were given the chance to participate, and therefore, we are not able to estimate the response rate. Second, due to sampling techniques, the majority of participants were younger than 55, and therefore, they were not eligible for screening. This may partially explain the relatively little interest in screening observed in the sample. Additionally, the recruitment procedure resulted in a relatively young sample (median age = 32). Therefore, the findings might not be generalizable to individuals who are eligible for lung screening. Further, the small percentage of individuals who
were eligible to screen restricted our ability to compare and contrast results by screening eligibility. Third, the cross-sectional design hindered our ability to identify any causal relations between variables. Fourth, although lung screening is associated with a 16% reduction in lung-cancer related mortality among eligible individuals [4], it is only a “B” recommendation by the USPSTF, meaning that there is “high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial” [5]. Therefore, some of the findings we observed might be explained by health care providers not perceiving this recommendation favorably. However, we did not measure whether participants actually had seen a health care provider anytime during the past 12 months. So, low rate of discussing lung cancer with physicians might be related to either 1) lack of recommendation by physicians or 2) not seeing a physician at all during the past 12 months prior to data collection. Fifth, construct validity is a concern for the knowledge scale due to the way it was measured as explained above. Finally, recruitment followed convenience and snowball sampling procedures, which limits generalizability to all adult Muslims in the US. However, data was collected from participants who resided in 30 states across the US, which lessens this threat to external validity.

In spite of the mentioned limitations, we believe this study has presented important findings with regard to interest in lung screening among US Muslims. This was the first study to investigate the SCT factors that are associated with interest in lung screening among adult Muslims in the US. Additionally, we utilized a sound theoretical framework that allowed for a thorough review of the associations with interest in lung screening. We believe that including such a comprehensive theoretical framework was advantageous because the majority of participants were foreign-born. Therefore, they may have distinct health behavior attitudes due to different cultural backgrounds. We expect this study to be a basis for future research into the
development and evaluation of interventions that aim to improve adherence to preventive health measures, such as preventive lung screening, in eligible adult US Muslims. Such interventions can be based on demonstrating LDCT screening, demonstrating the value of screening, and assisting and guiding individuals through the steps of completing the screening.

Acknowledgement

Thanks to Omar Abu Abed, Simin Falsafi, Ali Fakhimi, and Maleeha Hassan for assisting in translating the questionnaire.
References


60. National Health Interview, S. 2015.


Table 1. Descriptive Statistics, Unadjusted Odds Ratios, 95% Confidence Interval, and Wald Chi-Square from Binary Logistic Regression on Interest in Lung Screening. Adult (≥ 18 years) Muslims in the United States

<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>Interested in being Screened for Lung Cancer?</th>
<th>UOR (95% CI)</th>
<th>Wald</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No N=105 (40.1%)</td>
<td>Yes N=157 (59.9%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>Female N=58 (46.8%)</td>
<td>N=66 (53.2%)</td>
<td>0.588 (0.357 – 0.967)</td>
<td>4.369</td>
</tr>
<tr>
<td></td>
<td>Male N=47 (34.1%)</td>
<td>N=91 (65.9%)</td>
<td>[Reference]</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>M=36.36 (SD=11.81)</td>
<td>M=34.68 (SD=11.53)</td>
<td>0.988 (0.967 – 1.009)</td>
<td>1.307</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Married or living as married N=82 (40.0%)</td>
<td>N=123 (60.0%)</td>
<td>1.015 (0.558 – 1.846)</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>Not married N=23 (40.4%)</td>
<td>N=34 (59.6%)</td>
<td>[Reference]</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td>White N=71 (37.6%)</td>
<td>N=118 (62.4%)</td>
<td>1.449 (0.839 – 2.501)</td>
<td>1.772</td>
</tr>
<tr>
<td></td>
<td>Non-white N=34 (46.6%)</td>
<td>N=39 (53.4%)</td>
<td>[Reference]</td>
<td></td>
</tr>
<tr>
<td>Employment Status</td>
<td>Employed N=72 (40.7%)</td>
<td>N=105 (59.3%)</td>
<td>0.925 (0.545 – 1.571)</td>
<td>0.082</td>
</tr>
<tr>
<td></td>
<td>Not employed N=33 (38.8%)</td>
<td>N=52 (61.2%)</td>
<td>[Reference]</td>
<td></td>
</tr>
<tr>
<td>Education (Scale from 1 – 4)</td>
<td>M=2.82 (SD=1.02)</td>
<td>M=2.90 (SD=1.03)</td>
<td>1.069 (0.977 – 1.160)</td>
<td>0.291</td>
</tr>
<tr>
<td>Income (Scale from 1 – 9)</td>
<td>M=5.58 (SD=1.98)</td>
<td>M=5.20 (SD=1.94)</td>
<td>0.905 (0.796 – 1.029)</td>
<td>2.307</td>
</tr>
<tr>
<td>Health insurance</td>
<td>No N=11 (55.0%)</td>
<td>N=9 (45.0%)</td>
<td>0.520 (0.207 – 1.301)</td>
<td>1.953</td>
</tr>
<tr>
<td></td>
<td>Yes N=94 (38.8%)</td>
<td>N=148 (61.2%)</td>
<td>[Reference]</td>
<td></td>
</tr>
<tr>
<td>Self-assessed health (Scale from 0 – 100)</td>
<td>M=85.24 (SD=19.44)</td>
<td>M=81.74 (SD=18.79)</td>
<td>0.990 (0.977 – 1.004)</td>
<td>2.098</td>
</tr>
<tr>
<td>Sect</td>
<td>Sunnah N=45 (34.1%)</td>
<td>N=87 (65.9%)</td>
<td>1.657 (1.007 – 2.728)</td>
<td>3.945</td>
</tr>
<tr>
<td></td>
<td>Something else N=60 (46.2%)</td>
<td>N=70 (53.8%)</td>
<td>[Reference]</td>
<td></td>
</tr>
<tr>
<td>Awareness of LDCT</td>
<td>No N=61 (43.6%)</td>
<td>N=79 (56.4%)</td>
<td>0.731 (0.444 – 1.202)</td>
<td>1.526</td>
</tr>
<tr>
<td></td>
<td>Yes N=44 (36.1%)</td>
<td>N=78 (63.9%)</td>
<td>[Reference]</td>
<td></td>
</tr>
<tr>
<td>Ever changed religion</td>
<td>No N=96 (38.9%)</td>
<td>N=151 (61.1%)</td>
<td>2.359 (0.814 – 6.839)</td>
<td>2.499</td>
</tr>
<tr>
<td></td>
<td>Yes N=9 (60.0%)</td>
<td>N=6 (40.0%)</td>
<td>[Reference]</td>
<td></td>
</tr>
<tr>
<td>Tobacco use status</td>
<td>Current user N=37 (39.4%)</td>
<td>N=57 (60.6%)</td>
<td>0.869 (0.510 – 1.482)</td>
<td>0.265</td>
</tr>
<tr>
<td></td>
<td>Former user N=9 (30.0%)</td>
<td>N=21 (70%)</td>
<td>1.515 (0.626 – 3.665)</td>
<td>0.848</td>
</tr>
<tr>
<td></td>
<td>Non user N=59 (42.8%)</td>
<td>N=79 (57.2%)</td>
<td>[Reference]</td>
<td></td>
</tr>
<tr>
<td>Eligibility for lung screening?</td>
<td>Eligible N=98 (39.8%)</td>
<td>N=148 (60.2%)</td>
<td>0.851 (0.307 – 2.361)</td>
<td>0.096</td>
</tr>
<tr>
<td></td>
<td>Not eligible N=7 (43.8%)</td>
<td>N=9 (56.2%)</td>
<td>[Reference]</td>
<td></td>
</tr>
<tr>
<td>Cognitive Factors</td>
<td>Knowledge (Scale from 0 – 3) M=2.22 (SD=0.92)</td>
<td>M=1.45 (SD=1.03)</td>
<td>0.460 (0.349 - 0.606)</td>
<td>30.431</td>
</tr>
<tr>
<td></td>
<td>Expectations (Scale from 1 – 5) M=2.11 (SD=0.95)</td>
<td>M=3.20 (SD=0.98)</td>
<td>3.094 (2.256 - 4.244)</td>
<td>49.089</td>
</tr>
<tr>
<td></td>
<td>Perceived value (Scale from 1 – 5) M=1.83 (SD=1.01)</td>
<td>M=3.21 (SD=0.99)</td>
<td>4.852 (3.211 - 7.332)</td>
<td>56.226</td>
</tr>
<tr>
<td></td>
<td>Attitudes (Scale from 1 – 5) M=2.64 (SD=1.06)</td>
<td>M=3.89 (SD=0.75)</td>
<td>3.436 (2.541 - 4.647)</td>
<td>64.257</td>
</tr>
<tr>
<td></td>
<td>Self-efficacy (Scale from 0 – 100) M=38.93 (SD=24.22)</td>
<td>M=63.06 (SD=25.37)</td>
<td>1.037 (1.026 - 1.048)</td>
<td>41.646</td>
</tr>
<tr>
<td>Environmental Factors</td>
<td>No</td>
<td>Yes</td>
<td>UOR (95% CI)</td>
<td>Sig.</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------</td>
<td>-------------</td>
<td>--------------</td>
<td>------</td>
</tr>
<tr>
<td>Vicarious learning – Family</td>
<td>N=102 (41.0%)</td>
<td>N=147 (59.0%)</td>
<td>0.432 (0.116 – 1.610)</td>
<td>1.563</td>
</tr>
<tr>
<td>Vicarious learning – Friends</td>
<td>N=103 (42.6%)</td>
<td>N=139 (57.4%)</td>
<td>0.150 (0.034 - 0.661)</td>
<td>6.289</td>
</tr>
<tr>
<td>Social norms – Family (Scale from 1 – 3)</td>
<td>M=2.10 (SD=0.44)</td>
<td>M=2.28 (SD=0.50)</td>
<td>2.204 (1.272 - 3.819)</td>
<td>7.935</td>
</tr>
<tr>
<td>Social norms – Friends (Scale from 1 – 3)</td>
<td>M=2.06 (SD=0.41)</td>
<td>M=2.24 (SD=0.47)</td>
<td>2.623 (1.429 - 4.817)</td>
<td>9.679</td>
</tr>
<tr>
<td>Religiosity (Scale from 0 – 100)</td>
<td>M=51.77 (SD=32.34)</td>
<td>M=62.71 (SD=32.39)</td>
<td>1.010 (1.003 - 1.018)</td>
<td>6.899</td>
</tr>
<tr>
<td>Acculturation (Scale from 0 – 100)</td>
<td>M=56.57 (SD=29.20)</td>
<td>M=50.94 (SD=32.72)</td>
<td>0.994 (0.986 – 1.003)</td>
<td>1.826</td>
</tr>
<tr>
<td>Discussion with Physician</td>
<td>N=99 (39.6%)</td>
<td>N=151 (60.4%)</td>
<td>1.525 (0.478 – 4.864)</td>
<td>0.509</td>
</tr>
</tbody>
</table>

Abbreviations: N, Number, M, Mean, SD, Standard Deviation, UOR, Unadjusted Odds Ratio, CI, Confidence Interval, Wald, Wald Chi-square, Sig., Statistically Significant at a level of 0.05
Table 2. Adjusted Odds Ratios, 95% Confidence Interval, and Wald Chi-Square from Binary Logistic Regression on Interest in Lung Screening. Adult (≥ 18 years) Muslims in the United States

<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>AOR (95% CI)</th>
<th>Wald</th>
<th>p-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>0.740 (0.349 - 1.572)</td>
<td>0.612</td>
<td>.434</td>
<td></td>
</tr>
<tr>
<td>Male [Reference]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sect</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunnah</td>
<td>1.131 (0.457 - 2.799)</td>
<td>0.071</td>
<td>.791</td>
<td></td>
</tr>
<tr>
<td>Something else or nothing in particular [Reference]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>0.695 (0.466 - 1.037)</td>
<td>3.180</td>
<td>.075</td>
<td></td>
</tr>
<tr>
<td>Expectations</td>
<td>1.472 (0.968 - 2.237)</td>
<td>3.267</td>
<td>.071</td>
<td></td>
</tr>
<tr>
<td>Perceived value</td>
<td>1.743 (1.176 - 2.585)</td>
<td>7.643</td>
<td>.006</td>
<td>*</td>
</tr>
<tr>
<td>Attitudes</td>
<td>2.296 (1.384 - 3.809)</td>
<td>10.353</td>
<td>.001</td>
<td>*</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>1.018 (1.004 - 1.032)</td>
<td>6.571</td>
<td>.010</td>
<td>*</td>
</tr>
<tr>
<td>Environment Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vicarious learning – Friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0.237 (0.029 - 1.916)</td>
<td>1.824</td>
<td>.177</td>
<td></td>
</tr>
<tr>
<td>Yes [Reference]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social norms - Family</td>
<td>0.567 (0.172 - 1.867)</td>
<td>0.871</td>
<td>.351</td>
<td></td>
</tr>
<tr>
<td>Social norms - Friends</td>
<td>0.785 (0.222 - 2.784)</td>
<td>0.140</td>
<td>.708</td>
<td></td>
</tr>
<tr>
<td>Religiosity</td>
<td>1.006 (0.993 - 1.020)</td>
<td>0.773</td>
<td>.379</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: AOR, Adjusted Odds Ratio, CI, Confidence Interval, Wald, Wald Chi-square, Sig., Statistically Significant at a level of 0.05
Chapter Five

Summary and Conclusion

Summary of Context and Background

Tobacco use is the leading cause of premature death and preventable illness nationally and globally. In terms of mortality, tobacco use is associated with approximately 1,300 deaths every day in the United States (US), which constitute 20% of all deaths in the US. In terms of morbidity, tobacco use is associated with several life-threatening diseases, including lung cancer. Even though prevalence rates of cigarette smoking in the US have declined over the past few decades, the overall rate of use of any tobacco product has been constant (21.3%) over the past few years. In sum, tobacco use continues to be a major cause of premature death and preventable illness in the US.

The US Preventive Services Task Force (USPSTF) and the Community Preventive Services Task Force recommend that physicians encourage current tobacco users to quit, assess their readiness to quit, provide pharmaceutical and behavioral assistance, and arrange for follow-up and future support. Additionally, the USPSTF recommends annual lung screening for certain current and former smokers in order to reduce mortality and morbidity associated with lung disease through early detection. Current and former smokers might be eligible for preventive annual lung screening based on their smoking history, age, and health status.

Prevalence of tobacco use and readiness to quit smoking vary based on demographic factors. For example, US Muslims exhibit elevated tobacco use rates. Thus, they may exhibit higher morbidity and mortality rates in comparison with the rest of the US population. Additionally, as the majority of this population is foreign-born, their receptiveness to smoking...
cessation campaigns,\textsuperscript{15} as well as their interest in being screened for lung cancer,\textsuperscript{16} might be related to their acculturation level. With its high fertility rate and increased immigration, the US Muslim population is one of the fastest growing populations in the US.\textsuperscript{17} Therefore, their health-related behavior, such as tobacco use, smoking cessation, and interest in lung screening, is becoming more noticeable, and may increasingly constitute a more salient health issue in the US.

Previous studies that explored factors associated with tobacco use in Muslims in the US were limited to certain ethnicities, certain age categories, or area of data collection. Additionally, there was a gap in the literature concerning the SCT factors associated with serious smoking cessation attempts (SSCA) among US Muslim smokers. Further, no prior studies have explored the SCT factors that are associated with being interested in undergoing lung screening among US Muslims. Most importantly, no prior studies used a comprehensive behavioral model that encompasses cognitive (e.g., self-efficacy) as well as environmental factors (e.g. social norms) to investigate the factors that are associated with tobacco use, SSCA, and interest in lung screening. Understanding the overall impact of cognitive and environmental factors on tobacco use status, SSCA, and interest in lung screening is important as it may guide devising future interventions aimed at reducing tobacco use rates, especially cigarette smoking rates, and promoting lung cancer among eligible US Muslim individuals.

Due to its inclusion of cognitive and environmental factors, the Social Cognitive Theory (SCT)\textsuperscript{18} is well-suited to investigate the above-mentioned outcomes in US Muslims. This theoretical model proposes that 2 sets of factors (i.e., cognitive and environmental) influence each other and influence behavior. Cognitive factors include knowledge of the consequences, outcome expectations, perceived value of the consequences, attitudes regarding the behavior, and self-efficacy in terms of one’s confidence in their ability to perform the behavior. Environmental
factors include vicarious learning (i.e., learning through observing others), perceived social norms (i.e., cultural standards), and barriers and facilitators influencing behavior. Based on this theoretical model, the current dissertation aimed to examine the associations between SCT factors and 1) tobacco use, 2) number of SSCA, and 3) interest in lung screening in a sample of adult Muslims in the US.

**Summary of Methods**

A cross-sectional design was utilized to collect data between November 2016 and March 2017 from a convenience sample of adult (≥ 18 years old) US Muslims who had no personal history of lung cancer. Participants were recruited online using social media sites, as well as through local Islamic centers and organizations in the US. We used Qualtrics platform as a survey tool to collect responses online. The questionnaire is attached below (Appendix 1).

**Summary of Findings**

The sample demographic characteristics are presented in Table 1. For the first study, 271 eligible participants completed the questionnaire. More than half (52.8%) of the sample reported current tobacco use, and more than half of current users (n=74, 51.7%) reported concurrent use of more than one tobacco product. Men were more likely than women to report current tobacco use. Cigarettes and water-pipes were the most commonly used tobacco products. Even though the majority (60.2%) of the sample was foreign-born, two-thirds (66.4%) of the sample completed the questionnaire in English. The findings of the multinomial logistic regression analyses demonstrated that several cognitive and environmental factors were significantly associated with tobacco use status. In terms of association with current use as opposed to non-use of tobacco, individuals with 1) higher perceived impact of tobacco use on personal health, and 2) higher confidence in ability to abstain from tobacco, were less likely to report current tobacco
use. With regard to environmental factors, individuals with no tobacco users among their first-degree family members - as opposed to those who have at least one tobacco user among first-degree family members - were less likely to report current tobacco use. Finally, there was a significant interaction between sex and attitudes in association with tobacco use status. Compared with men who had negative views on tobacco use, women with negative views on tobacco use were less likely to report current tobacco use. This finding indicated that sex of respondent plays a moderating effect in the relation between attitude and tobacco use.

In terms of association with former tobacco use as opposed to non-use, increased knowledge about the general expectations of tobacco use was associated with a greater likelihood of being a non-user. With regard to environmental factors, individuals were more likely to report former tobacco use rather than non-use if they had no tobacco users among their friends and if they reported higher religiosity. Finally, individuals with higher self-assessed health were less likely to report former tobacco use rather than non-use.

The sample for the second study included 132 adult US Muslim current smokers who met the eligibility criteria. Again, even though the majority (58.9%) of participants were foreign-born, the majority of them (68.9%) completed the questionnaire in English. Sixty-two smokers (47.0%) seriously attempted to quit smoking at least once over the past 12 months. Among those who had at least one SSCA, 24 used nicotine replacement, 31 smokers reported not using any form of assistance, and the rest reported using either prescription medications or counseling. Only 3 smokers reported using both prescription medications and counseling to aid with SSCA. Results of adjusted Poisson regression analysis demonstrated that smokers reported more serious smoking cessation attempts if they 1) had more knowledge about the consequences of smoking cessation, 2) had more positive attitude regarding quitting, and 3) reported greater religiosity.
Additionally, smokers reported fewer serious smoking cessation attempts if they 1) were employed, 2) affiliated with Sunnah sect, 3) reported better self-assessed health, 4) reported higher perceived value for quitting, and 5) indicated that using tobacco was not allowed inside the home.

The third sample was composed of 271 adult US Muslims who met the eligibility criteria. More than half of participants (59.9%) were interested in being screened for lung cancer. Based on age and smoking history, 16 participants (5.9%) might have been eligible to screen with LDCT, the majority of which (n=12, 75%) were men. Among these 16 participants, none had been screened at the time of data collection, and only one participant was asked by their health care provider about lung screening during the 12 months prior to data collection. Greater likelihood of being interested in screening for lung cancer was associated with more positive views on lung screening, higher perceived value for the consequences of screening, and greater self-efficacy regarding ability to perform the screening. According to the binary logistic regression model results, none of the environmental factors showed significant association with interest in lung screening at a p-value of ≤ 0.05.

**Discussion and Conclusions**

The results of this dissertation suggest that behaviors related to tobacco use and number of SSCA can be influenced by a myriad of cognitive and environmental factors. For example, factors that were associated with tobacco use status, or with SSCA, included demographic, cognitive, and environmental factors. Therefore, individuals’ tobacco-related behaviors could be influenced by cognitive and social influences, such as self-assessed health and religiosity. Future interventions aimed at reducing tobacco use in this population might include relevant cognitive and environmental factors based on the results of this research.
Knowledge of the consequences of behavior was a significant factor in the first and second studies. These significant associations indicate the importance of this construct in influencing tobacco use-related behavior. Considering the impact of health education on level of knowledge, especially in terms of tobacco use-related behaviors,20 our findings suggest that one way to fight the tobacco use epidemic in adult US Muslims is through promoting health education about the consequences of continuing to use tobacco, and the consequences of smoking cessation.

Religiosity was significantly associated with tobacco use status and with the number of SSCA. Therefore, religion-based interventions to curb tobacco use might be a focus for future research, especially in terms of encouraging cigarette smokers to quit. Our findings suggest that religiosity can promote smoking cessation, but the relation with tobacco use is less clear. Because former smokers reported more religiosity than non-users, they may have used their religious beliefs to facilitate smoking cessation. However, future longitudinal studies are required to further investigate this relation in order to more clearly understand the effect of religiosity on tobacco-related behavior, and to examine how this construct can be included in future interventions aimed at curbing tobacco use.

In contrast to findings on tobacco use and smoking cessation, we found that interest in undergoing lung screening was mostly influenced by cognitive factors. This finding, however, was not consistent with previous research on breast and cervical screening among US Muslim women that found that culture and religion-related factors can influence screening rates for US Muslim women compared to other groups comprising the US population.21,22 This difference in findings, however, might be attributed to difference in behaviors between men and women in terms of preventive cancer screening. This interpretation is supported by a finding in the third
study, which demonstrated that a higher percentage of men (66%) compared to women (53%) were interested in lung screening, with this difference being statistically significant ($p$-value = .037). Another interpretation might be that lung screening procedures were not perceived to conflict with religious or cultural modesty beliefs and practices, and therefore, lung screening was more acceptable among Muslims. Previous research has indicated this barrier in terms of cervical and breast cancer among US Muslim women.\textsuperscript{23} To date, no research has explored this issue in terms of lung cancer screening. The last interpretation for lack of relative significance of environmental factors could be related to scarcity of role models who underwent lung screening, and whom others (e.g., family members, friends) can vicariously learn from. This is attributed to substantially low screening rate among individuals who are eligible for lung screening.\textsuperscript{24}

We believe that utilizing the SCT as a theoretical framework in this research allowed for collection of rich data that provided important conclusions about adult US Muslims’ behavior in terms of tobacco use, smoking cessation, and lung screening. For example, cognitive factors have shown significant associations with the studied outcomes, which yielded more meaningful understanding of the nuances of adult US Muslims’ behavior in terms of the studied outcomes. Additionally, using the SCT made it possible to differentiate between several cognitive factors allowing us to know which factors are more important in each of the studied outcomes. For instance, we found that perceived value, attitudes, and self-efficacy are more important than knowledge and expectations in terms of interest in lung screening. In terms of environmental factors, we found that only some factors were significantly associated with the studied outcomes. For example, vicarious learning was significantly associated with tobacco use status, but was not significantly associated with number of SSCA nor with interest in lung screening. Additionally, perceived social norms were significantly associated with the studied outcomes in the unadjusted
regression models, but were not significantly associated with any of the studied outcomes in the adjusted models. Another construct that was not significantly associated with the studied outcomes was acculturation, which included several factors as parts of its scale including immigration status. Even though acculturation was significantly related to tobacco use and number of SSCA in the unadjusted regression models, it was not significantly associated with any of the studied outcomes in the adjusted models. The observation might be explained by lack of influence for perceived cultural standards and acculturation on the studied outcomes among adult US Muslims. Another interpretation might be that the observed associations in the unadjusted models are explained by other factors that were included in the adjusted models. Future research are required to fully understand these observations, perhaps through exploring the association of social norms and acculturation with other SCT factors, especially if a larger sample is utilized allowing for higher statistical power in detecting significant associations.

Consistent with the general Muslim population in the US, the majority of participants in our study were foreign-born. Due to having spent part of their lives outside the US, they may not have had sufficient education about the overall detrimental consequences of tobacco use on societies, as well as personal impact of tobacco use on health. This makes patient-provider communication more essential as it promotes patient health education and increases awareness of the negative consequences of tobacco use. This, however, might be a challenge with regard to Muslim patients who seek health care in the US. Certain barriers (e.g., language barriers) may limit patient-provider communication. For example, the percentages of participants who reported discussing tobacco use, smoking cessation, and lung screening with their health care providers anytime over the past 12 months were only 68.3%, 79.5%, and 4.6%, in the first, second, and third studies, respectively. Additionally, among those who were eligible to obtain lung cancer
screening (16 participants) in Study 3, only one participant was reportedly asked by their health care provider about lung screening during the 12 months prior to data collection. In sum, lack of effective patient-provider communication in the sample might be a barrier to curbing tobacco use rates and adhering to lung screening guidelines among eligible US Muslim individuals.

This research study has demonstrated some unique characteristics for the adult US Muslim population in terms of tobacco use, number of serious smoking cessation attempts, and interest in lung screening. Even though the majority of this population is foreign-born, our findings indicated that some environmental and cultural factors (e.g., acculturation, social norms) were not associated with any of the studied outcomes in adjusted regression model, as mentioned above. Additionally, vicarious learning was associated with tobacco use status, but not with number of serious smoking cessation attempts or interest in lung screening. Therefore, the uniqueness of this population, reflected by significant associations with the studied outcomes, was mainly exhibited by cognitive beliefs, not by environmental factors. In sum, despite cultural and environmental uniqueness of adult US Muslims in comparison with the rest of the US population, individuals’ cognitive factors were more significant than cultural factors in influencing the studied outcomes.

According to the USPSTF, eligibility for preventive annual lung screening is based on several factors that include smoking history, but not use of other tobacco products. However, more than half (51.7%) of current tobacco users in our first study reported concurrent use of more than one tobacco product. This complicates the decision-making process regarding recommending lung screening that primarily takes smoking history into account without considering alternative forms of tobacco use. We believe that lack of comprehensive guidelines concerning users of other tobacco products, such as water-pipes, should not necessarily exclude
these tobacco users from being referred for lung screening. Therefore, health care providers should be encouraged to assess the intensity of all forms of tobacco use, and therefore, make individualized decisions on whether tobacco users should be referred for lung screening. Additionally, studies in the future should investigate the reduction in morbidity and mortality due to lung screening among users of other common types of tobacco products. With current controversies concerning lung screening,25 patient-provider communication, along with shared-decision making, are even more essential in the decision-making process regarding recommending lung screening.

**Limitations & Strengths**

This dissertation study has certain limitations that should be noted. First, due to the cross-sectional nature of the study design, we were not able to identify any causal relations for the observed associations. For example, the association of lower self-efficacy with current tobacco use could be interpreted by lower self-efficacy being the outcome, and not the predictor, of current tobacco use. Further, in the first study, we could not identify the factors that predicted switching among different tobacco uses statuses. Future research may address these potential relations by utilizing longitudinal research designs. Second, because recruitment was conducted online and was voluntary, we could not enumerate the number of individuals who had the chance to participate in the questionnaire, and therefore, we were not able to determine the response rate. As a result, non-response bias might be a significant concern. Third, recruitment procedures (i.e., convenience and snowball sampling procedures) may add a limitation concerning selection bias as participants were not randomly selected. For example, the majority of the sample completed the questionnaire in English or Arabic, with few respondents who completed the questionnaire in Farsi or Urdu. Additionally, our sample was significantly younger than the US population, as
shown in Table 1. This may limit the external validity of the findings, and therefore, we are unable to generalize the results to the general adult Muslim US population. However, we believed that following this recruitment technique was necessary because of the small percentage of Muslims in the US. Additionally, this limitation is lessened by the fact that the study participants were residents in several states across the US (30 states for the first and third studies, and 23 states for the second study). Fourth, Zip Codes were not measured in the questionnaire. Therefore, comparing responses based on urban/rural residence was not possible. Fifth, relying on self-reported data and single-item measures that were not previously validated may lessen the reliability and validity of our findings. Finally, due to small sample size, the study may have had inadequate statistical power to detect significant associations. Therefore, results should be interpreted with caution as reliability of the findings may be a concern.

The limitations mentioned above are outweighed by the innovation associated with studying a sample that is rarely examined in the literature. This was the first study to assess tobacco use, number of serious attempts to quit smoking, and interest in lung screening in a sample of adult Muslims in the US. Additionally, this is the first study to utilize a comprehensive behavioral model, which allowed for the theoretically sound investigation of the associations between the outcomes of interest and environmental factors as well as cognitive factors. Addressing the socioeconomic factors in this research was crucial because the majority of US Muslims are foreign-born, and therefore, they may have cultural and social norms that are different from prevailing cultural and social norms for the rest of the US population. Finally, the study questionnaire was administered in 4 languages (i.e., Arabic, English, Farsi, and Urdu) in order to maximize the response rate. The selection of these languages followed previous research examining Muslims in the US.
Overall, identifying the factors associated with the three mentioned outcomes is anticipated to guide future research that aim to curtail tobacco use and promote adherence to lung screening guidelines in adult US Muslims. Agencies interested in research related to preventive health care, such as USPSTF, may need to investigate the harms caused by use of other tobacco products, and therefore, publish guidelines concerning lung screening needs and recommendations for individuals who use other tobacco products, or a combination of different tobacco products.
Bibliography


Table 1. Demographic Characteristics and One-sample t-test. A Sample of Muslim Adults (≥ 18 years) in the United States
(Column Percentages and Significant Difference Statistics)

<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>Categories</th>
<th>Our Sample</th>
<th>US Population Statistics</th>
<th>Statistics of Significant Difference of Sample from the US Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Male</td>
<td>53.5%</td>
<td>49.2%</td>
<td>( t(270) = 1.418, p = .157 )</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>46.5%</td>
<td>50.8%</td>
<td></td>
</tr>
<tr>
<td>Adults Mean Age</td>
<td></td>
<td></td>
<td></td>
<td>( t(270) = -9.350, p &lt; .001 )</td>
</tr>
<tr>
<td>Race</td>
<td>White</td>
<td>72.3%</td>
<td>76.9%</td>
<td>( t(270) = 1.680, p = .094 )</td>
</tr>
<tr>
<td></td>
<td>Non-white</td>
<td>27.7%</td>
<td>23.1%</td>
<td></td>
</tr>
<tr>
<td>Employment Status</td>
<td>Employed</td>
<td>66.8%</td>
<td>63.1%</td>
<td>( t(270) = 1.287, p = .199 )</td>
</tr>
<tr>
<td></td>
<td>Not employed</td>
<td>33.2%</td>
<td>36.9%</td>
<td></td>
</tr>
<tr>
<td>Health insurance</td>
<td>No</td>
<td>7.7%</td>
<td>8.8%</td>
<td>( t(270) = 0.646, p = .519 )</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>92.3%</td>
<td>91.2%</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: \( t \), One-sample t-test, \( p \), significance level or \( p \)-value, * Parameters are based on information from US Bureau of Labor Statistics \(^{26}\) and US Census Bureau.\(^{11,27,28}\)
Appendix 1: The study questionnaire

Start of Block: Default Question Block

Q0.1 Choose language/اختر اللغة/کریئ انتخاب کا زبان/اللغة اختيار

- [ ] English (1)
- [ ] العربية (2)
- [ ] فارسی (3)
- [ ] اردو (4)
Principal Investigator: Kimberly Kelly, PhD
Department: Pharmaceutical Systems & Policy
Protocol Number: 1609266133
Study Title: Using Tobacco Products, Serious Attempts to Quit Smoking, and Interest in Lung Screening among Adult Muslims in the United States
Key Personnel: Kevin Larkin, PhD; Fadi Alkhateeb, PhD; Michael Newton, PharmD; Usha Sambamoorthi, PhD; Omar Attarabeen, RPh

Contact Persons
This is a research study. If you have any comments, questions, or concerns, please contact Omar Attarabeen, R.Ph., at phone number (304) 696-6019, or at mailing address PO Box 9510, HSC, School of Pharmacy, Morgantown, WV 26505. If you want more information about your rights as a research subject, or to discuss any comments, questions, concerns, or suggestions related to this research, please contact the Office of Research Integrity & Compliance at (304) 293-7073.

Introduction
This study is coordinated by Kimberly Kelly, PhD. This study is part of a dissertation project for Omar Attarabeen, RPh. Other personnel who are involved in this study are Kevin Larkin, PhD; Fadi Alkhateeb, PhD; Michael Newton, PharmD; and Usha Sambamoorthi, PhD. We invite you to take part in this study.

Purpose of the Study
This study aims to learn more about health behavior among Muslims in the United States with regard to using tobacco and lung screening.

Description of Procedures
This study is based on collecting information using a survey. Time to complete the study is approximately 15 minutes. We ask you to respond to questions with regard to using tobacco and lung screening. There are no right or wrong answers. Please answer based on your behaviors or beliefs. Please note that participation in this study is optional. You may skip any questions if you want, and you may choose not to participate in the study at all.

Discomforts
We do not expect any risks from participating in this study. You may experience minimal worry because of thinking about your personal history of using tobacco or lung screening. If you need counseling, please let us know so that we refer you to the right personnel.

Benefits
There will be three $50 gift cards, which will be distributed to three participants based on a random drawing. This drawing will be conducted after data collection is complete, no later than 03/31/2017. You are not required to provide your e-mail address. However, if you choose to provide it, we will contact you if you are selected for a $50 gift card in the random drawing. Contact information will not be linked to data collected.

Financial Considerations
There is no fee to participate in this study. However, if you request any counseling as explained in the "Discomforts" section above, it will be at your expense.

Confidentiality/Voluntary Participation
This study will be anonymous. The information we will collect will be kept confidential. Please note that participation in this study is voluntary. You have the option to cancel your consent of participation in this study at any time. There is no penalty for refusal to participate in the study or for deciding to cancel the consent of participation. The study findings will be presented in aggregates. No identifying information will be collected, presented, or published.
Q0.2
I am willing to participate in this questionnaire

☐ Yes (1)

☐ No (2)

End of Block: Default Question Block

Start of Block: Block 1

I1 The purpose of this survey is to learn about your viewpoint with regard to tobacco use and lung screening. The first section is about tobacco use. Please answer based on your own beliefs or behaviors. There are no right or wrong answers.

Q1 Have you smoked at least 100 cigarettes in your entire life?

☐ No (1)

☐ Yes (2)

Q2 How often do you now smoke cigarettes?

☐ Not at all (1)

☐ Some days (2)

☐ Every day (3)
Q3 Which of the following products have you tried, even just one time? (Please check all that apply. If you did not use any of the following products, please check "I did not use any of these products")

☐ Cigarettes (1)

☐ Shisha or Hookah (waterpipe, narghile, goza, or hubble bubble pipes) (2)

☐ Snus (3)

☐ Electronic cigarettes (e-cigarettes or vaporizers) (4)

☐ Khat (Catha edulis) (5)

☐ Bidis (6)

☐ Kretek (7)

☐ Chewing tobacco (pan/gutka or ghutka) (8)

☐ Cigar (9)

☐ Smokeless tobacco (10)

☐ Cigarillos (11)

☐ Biri (12)

☐ Betel nut (Areca nut) (13)

☐ Pipe (14)

☐ Other products (Please specify) (15)

________________________________________________

☐ I did not use any of these products (16)
Q4 During the past 30 days, did you use any form of tobacco mentioned above?

- No (1)
- Yes (2)

Q5 How often do you use tobacco?

- More than once a day (1)
- One a day (2)
- A few times a week (3)
- Once a week (4)
- Two or 3 times a month (5)
- Once a month (6)
- Once every few months, or less often (7)

Q6 How old were you when you first started to use tobacco fairly regularly?
Q7 How likely is it that tobacco users, in general, will contract diseases or die due to tobacco use?

- More than 80% likely (1)
- 60%-80% likely (2)
- 40%-60% likely (3)
- 20%-40% likely (4)
- Less than 20% likely (5)

End of Block: Block 1

Start of Block: Block 2

Q8 How much do you think it would affect your health if you were to use tobacco?

- Not at all (1)
- A little (2)
- Somewhat (3)
- A lot (4)
- Extremely (5)
Q9 What is your overall opinion of using tobacco?

- Very negative (1)
- Negative (2)
- Neither negative nor positive (3)
- Positive (4)
- Very positive (5)

Q10 How important is it to you that you abstain from tobacco?

- Not at all important (1)
- Slightly important (2)
- Moderately important (3)
- Very important (4)
- Extremely Important (5)

Q11 On a scale from 0% to 100%, how certain are you that you could abstain from using tobacco, such as when you spend time with friends who use tobacco?
Q12 Among your best friends, is at least one of them a tobacco user?

- No (1)
- Yes (2)

Q13 Among your first-degree family members (spouse, parents, brothers, sisters, sons, daughters), is at least one of them a tobacco user?

- No (1)
- Yes (2)

Q14 My friends think that using tobacco products is:

- Absolutely inappropriate (1)
- Slightly inappropriate (2)
- Neither inappropriate nor appropriate (3)
- Slightly appropriate (4)
- Absolutely appropriate (5)
Q15 My family members think that using tobacco products is:

- Absolutely inappropriate (1)
- Slightly inappropriate (2)
- Neither inappropriate nor appropriate (3)
- Slightly appropriate (4)
- Absolutely appropriate (5)

End of Block: Block 3

Start of Block: Block 4

Q16 Which statement best describes the rules about using tobacco inside your home?

- Using tobacco is not allowed anywhere inside my home (1)
- Using tobacco is allowed some places or at some times (2)
- Using tobacco is allowed anywhere inside my home (3)

Q17 During the past 12 months, has a doctor or other health professional asked you about your tobacco use status?

- No (1)
- Yes (2)
I2
The second section of the questionnaire is about smoking and attempts to quit smoking. Please answer based on your own beliefs or behaviors. There are no right or wrong answers.

Q18 During the past 12 months, how many times have you stopped smoking for one day or longer because you were trying to quit smoking?

______________________________________________________

Q19 On average, how many cigarettes do you smoke a day?

________________________________________________________________

Q20 How likely is it that quitting smoking, in general, will reduce chances of diseases or death?

- More than 80% likely (1)
- 60%-80% likely (2)
- 40%-60% likely (3)
- 20%-40% likely (4)
- Less than 20% likely (5)
Q21 How much do you think it would benefit your health if you were to quit smoking?

- Not at all (1)
- A little (2)
- Somewhat (3)
- A lot (4)
- Extremely (5)

Q22 What is your overall opinion of quitting smoking?

- Very negative (1)
- Negative (2)
- Neither negative nor positive (3)
- Positive (4)
- Very positive (5)
Q23 How important is it to you that you quit smoking and live a longer life?

- Not at all important (1)
- Slightly important (2)
- Moderately important (3)
- Very important (4)
- Extremely important (5)

Q24 On a scale from 0% to 100%, how certain are you that you could succeed in completely giving up smoking during the next 6 months, if you decided to do so?

0 10 20 30 40 50 60 70 80 90 100

Degree of Certainty (1)

Q25 Among your best friends, is at least one of them a former smoker?

- No (1)
- Yes (2)
Q26 Among your first-degree family members (spouse, parents, brothers, sisters, sons, daughters), is at least one of them a former smoker?

○ No (1)

○ Yes (2)

Q27 My friends think that quitting smoking is:

○ Absolutely inappropriate (1)

○ Slightly inappropriate (2)

○ Neither inappropriate nor appropriate (3)

○ Slightly appropriate (4)

○ Absolutely appropriate (5)

Q28 My family members think that quitting smoking is:

○ Absolutely inappropriate (1)

○ Slightly inappropriate (2)

○ Neither inappropriate nor appropriate (3)

○ Slightly appropriate (4)

○ Absolutely appropriate (5)
Q29 During the past 12 months, has a doctor or other health professional talked to you about quitting smoking?

○ No (1)

○ Yes (2)

Q30 Which of these methods have you used during the past 12 month to help with quitting smoking? (Check all that apply)

☐ Nicotine replacement, such as gum, patch, lozenges, spray, inhaler (1)

☐ Prescription medications, such as Wellbutrin SR, Chantix (2)

☐ Counseling or behavioral support (3)

☐ Attempted to quit smoking without any help (4)

Q31 How soon after you wake up do you smoke your first cigarette?

○ Within 5 minutes (1)

○ Within 31-60 minutes (2)

○ Within 6-30 minutes (3)

○ After 60 minutes (4)
The next few questions will ask you about lung screening using “Low Dose Computed Tomography”, which is also known as CT scan or CAT scan. Please answer based on your own knowledge.

Q32 Have you heard of “low-dose computed tomography (LDCT)”, a test to screen for lung cancer (also known as CT scan or CAT scan)?

○ No (1)

○ Yes (2)

Q33 Have you ever had low-dose computed tomography (LDCT), a test to screen for lung cancer (also known as CT scan or CAT scan)?

○ No (1)

○ Yes (2)

Q34 How long ago did you have your most recent low-dose computed tomography (LDCT), a test to screen for lung cancer (also known as CT scan or CAT scan)?

_________________________________________________________________________________________
Q35 Would you be interested in being screened for lung cancer if it were available to you for free?

- No (1)
- Yes (2)

Q36 Screening for lung cancer is enough to protect against lung cancer.

- False (2)
- True (3)

Q37 Screening for lung cancer is safe (not associated with any risk to health).

- False (1)
- True (2)

Q38 All smokers should screen for lung cancer regardless to their age.

- False (1)
- True (2)
Q39 How much do you think it would benefit your health if you were to have lung screening using low-dose computed tomography, also known as CT scan or CAT scan?

- Not at all (1)
- A little (2)
- Somewhat (3)
- A lot (4)
- Extremely (5)

Q40 What is your overall opinion of lung screening using low-dose computed tomography, also known as CT scan or CAT scan?

- Very negative (1)
- Negative (2)
- Neither negative nor positive (3)
- Positive (4)
- Very positive (5)
Q41 How important is it to you that you have lung screening using low-dose computed tomography, also known as CT scan or CAT scan?

- Not at all important (1)
- Slightly important (2)
- Moderately important (3)
- Very important (4)
- Extremely important (5)

Q42 On a scale from 0% to 100%, how certain are you that you could schedule and undergo a lung screening test using low-dose computed tomography, also known as CT scan or CAT scan?

Q43 Among your best friends, has at least one of them had lung screening?

- No (1)
- Yes (2)
Q44 Among your first-degree family members (spouse, parents, brothers, sisters, sons, daughters), has at least one of them had lung screening?

- No (1)
- Yes (2)

Q45 My friends think that lung screening is:

- Absolutely inappropriate (1)
- Slightly inappropriate (2)
- Neither inappropriate nor appropriate (3)
- Slightly appropriate (4)
- Absolutely appropriate (5)

Q46 My family members think that lung screening is:

- Absolutely inappropriate (1)
- Slightly inappropriate (2)
- Neither inappropriate nor appropriate (3)
- Slightly appropriate (4)
- Absolutely appropriate (5)
Q47 During the past 12 months, has a doctor or other health professional talked to you about lung screening?

○ No (1)
○ Yes (2)

---

I4
The next few questions will ask you about language, self-identity, and religious beliefs and practices. Please answer based on your beliefs or behaviors. There are no right or wrong answers.

---

Q48 Which language do you prefer to speak?

○ English (1)
○ A different language (The language of my family’s ethnic background) (2)

---

Q49 Do you identify yourself as:

○ American (1)
○ A different identity (My family’s ethnic background) (2)
Q50 How often do you attend places of worship or other religious meetings?

- Never (1)
- Once a year or less (2)
- A few times a year (3)
- A few times a month (4)
- Once a week (5)
- More than once every week (6)

Q51 How often do you spend time in private religious events? (For example: prayer, meditation or religious education)

- Rarely or never (1)
- A few times a month (2)
- Once a week (3)
- Two or more times/week (4)
- Daily (5)
- More than once a day (6)
Q52 In my life, I experience the presence of the Divine (God).

- Definitely not true (1)
- Tends not to be true (2)
- Unsure (3)
- Tends to be true (4)
- Definitely true of me (5)

Q53 My religious beliefs are what really lie behind my whole approach to life.

- Definitely not true (1)
- Tends not to be true (2)
- Unsure (3)
- Tends to be true (4)
- Definitely true of me (5)
Q54 I try hard to carry my religion over into all other dealings in life.

- Definitely not true (1)
- Tends not to be true (2)
- Unsure (3)
- Tends to be true (4)
- Definitely true of me (5)

End of Block: Block 9

Start of Block: Block 10

I5
This is the last section of the questionnaire. The next few questions will ask you about your characteristics. There are no right or wrong answers, please answer based on your knowledge.

Q55 Are you male or female?

- Male (1)
- Female (2)

Q56 What is your age?

-------------------------------------------------------------------
Q57 What is your race?

- American Indian/Alaskan Native (1)
- Asian (2)
- Black or African American (3)
- Native Hawaiian/Other Pacific Islander (4)
- White (5)
- Multiple Races (6)
- Other (Please specify): _______________________________________________________ 

Q58 Are you of Hispanic, Latino/a, or Spanish origin?

- No (1)
- Yes (2)

Q59 In what country do you live?

- In the United States (1)
- Elsewhere. Please specify: ___________________________________________________
Q60 In what State do you live?

________________________________________________________________

Q61 Where were you raised?

○ In a foreign country (4)

○ Mostly in a foreign country (5)

○ Mostly in the U.S. (6)

○ In the U.S. only (7)

Q62 If you are an immigrant, a son/daughter of an immigrant, or a grandchild of an immigrant, what country are you, or your family, is from originally?

________________________________________________________________

Q63 Which generation of immigrants are you?

○ First-generation (born outside the US) (1)

○ Second-generation (born in the US to at least one immigrant parent) (2)

○ Third- or higher-generation (born in the US to US-born parents) (3)
Q64 What is your current religion, if any?

- Islam (Muslim) (1)
- Protestant (2)
- Roman Catholic (3)
- Mormon (4)
- Orthodox (5)
- Hinduism (Hindu) (6)
- Judaism (Jewish) (7)
- Buddhism (Buddhist) (8)
- Confucianism (9)
- Taoism (10)
- Atheism (11)
- Agnosticism (12)
- Nothing in particular (13)
- Prefer not to answer (14)
- Something else (Please specify): (15)
Q65 What sect do you follow, if any?

- Sunnah (Sunni) (1)
- Shi’ah (Shiites) (2)
- Nothing in particular (3)
- Other (Please specify): (4) ________________________________________________

End of Block: Block 10

Start of Block: Block 11

Q66 Have you ever changed your religion?

- No (1)
- Yes (2)

Q67 What age did you convert to your current religion?

______________________________________________________
Q68 What is your marital status?

- Married (1)
- Living as married (2)
- Divorced (3)
- Widowed (4)
- Separated (5)
- Single, never been married (6)
Q69 What is the highest grade or level of schooling you completed?

- None (7)
- 1st Grade (8)
- 2nd Grade (9)
- 3rd Grade (10)
- 4th Grade (11)
- 5th Grade (12)
- 6th Grade (13)
- 7th Grade (14)
- 8th Grade (15)
- 9th Grade (16)
- 10th Grade (17)
- 11th Grade (18)
- 12th Grade (19)
- GED (20)
- Some College/technical/trade school, but less than 1 year (21)
- 1 or more years of College/technical/trade school, No Degree (22)
- Technical or Trade Degree or Certification (23)
- Associate Degree (for example: AA, AS) (24)
- Bachelor’s Degree (for example: BA, AB, BS, BSN) (25)
0 Master’s Degree (for example: MA, MS, MPH, MSW, MBA) (26)

0 Professional Degree (for example: MD, DDS, DVM, LLB, JD) (27)

0 Doctorate Degree (for example: PHD, EDD) (28)

0 Other (Please Specify) (29) ________________________________________________

Q70 What is your current employment status?

0 Employed (1)

0 Unemployed (2)

0 Homemaker (3)

0 Student (4)

0 Retired (5)

0 An individual with a disability (6)

0 Other (Please specify): (7) ________________________________________________

------------------------------------------------------------------
Q71 For the past year, what was your total household income before tax?

- $0 to $9,999  (1)
- $10,000 to $14,999  (2)
- $15,000 to $19,999  (3)
- $20,000 to $34,999  (4)
- $35,000 to $49,999  (5)
- $50,000 to $74,999  (6)
- $75,000 to $99,999  (7)
- $100,000 to $199,999  (8)
- $200,000 or more  (9)

End of Block: Block 11

Start of Block: Block 12

Q72 Do you have any kind of health insurance?

- No  (1)
- Yes  (2)
Q73 Have you ever been diagnosed as having lung cancer?

- No  (1)
- Yes  (2)

Q74 How would you rate your health today?

- Poor  (1)
- Fair  (2)
- Good  (3)
- Very good  (4)
- Excellent  (5)

Q75
Your responses have been recorded. Thank you for your time. In order to participate in the three $50 gift card drawing, please continue to the next page. You will be directed to another webpage in order to type in your e-mail address. We will contact you if you are selected in the random drawing.

Your answers to this survey will not be linked to your e-mail address. The e-mail address and the responses will be saved in 2 different files.
لا تتوفر أي معلومات موثقة في هذا البحث. يمكنني مساعدتك في الاستعراض وجمع المعلومات المناسبة.
A0.2
أوافق على المشاركة بهذا الاستبيان؟

نعم (2) ☐
لا (3) ☐

End of Block: Block A0

Start of Block: Block A1

الهدف من هذا الاستبيان هو للتعرف على وجهة نظرك بخصوص استخدام منتجات التبغ و المسح الرئوي. يتناول القسم الأول من هذا الاستبيان موضوع استخدام التبغ. رجاءً أجب اعتماداً على معتقداتك و سلوكيتك. ليس هناك إجابات صحيحة أو خاطئة.

A1 هل دخنت على الأقل 100 سيجارة في حياتك؟

لا (1) ☐
نعم (2) ☐

A2 وما مقدار استخدامك للسجائر؟

لا أستخدم السجائر حالياً (1) ☐
أستخدم السجائر بعض الأيام (2) ☐
أستخدم السجائر كل يوم (3) ☐
A3

أي من المواد التالية جربت استخدامها في حياتك، ولو مرة واحدة) أشر إلى جميع ما ينطبق من الإجابات؟

☐ السجائر (1)
☐ النارجيلة، الشيشة، أو الأرجيلة (2)
☐ سنوس، نسوار، أو التبغ الرطب (3)
☐ السجائر الإلكترونية (4)
☐ القات (5)
☐ البيدي (6)
☐ الكريتيك (7)
☐ تبغ المضغ فونكا (8)
☐ سيقار أو سيكار (9)
☐ التبغ غير المصحوب بالدخان (10)
☐ سيقاريلو، السيجار الرفيع (11)
☐ الليري (12)
☐ مضغ ثمار الفوكل أو الكوتل (13)
☐ الخيولون (14)
☐ مواد تبغية أخرى: الرجاء حدد هذه المواد (15)
☐ لم أستخدم أي من هذه المنتجات (16)

---

A4

خلال الثلاثين يوما الماضية، هل استخدمت أي من المنتجات المذكورة سابقا؟

☐ لا (1)
☐ نعم (2)
A5 What is your current tobacco use?

- More than once a day (1)
- Once a day (2)
- Several times a week (3)
- Once a week (4)
- Two to three times a month (5)
- Once a month (6)
- Less than once a month, or less (7)

A6 At what age did you start smoking?

A7 In general, what is the probability of tobacco users getting diseases or dying from smoking?

- More than 80% (1)
- Between 60% and 80% (2)
- Between 40% and 60% (3)
- Between 20% and 40% (4)
- Less than 20% (5)
باعتقادك، بما مدى ستتأثر صحتك باستخدام منتجات التبغ؟

1. ليس هناك أي تأثير
2. مقدار ضئيل من التأثير
3. مقدار متوسط من التأثير
4. مقدار كبير من التأثير
5. مقدار هائل جداً من التأثير

بشكل عام، ما رأيك باستخدام التبغ؟

1. فكرة سيئة جداً
2. فكرة سيئة
3. فكرة ليست سيئة ولا جيدة
4. فكرة جيدة
5. فكرة جيدة جداً
بالنسبة لك، ما أهمية الإمتاع عن استخدام التبغ؟

(1) الإمتاع عن استخدام التبغ ليس بالشيء المهم إطلاقاً
(2) الإمتاع عن استخدام التبغ مهم قليلاً
(3) الإمتاع عن استخدام التبغ مهم بدرجة متوسطة
(4) الإمتاع عن استخدام التبغ مهم بدرجة عالية
(5) الإمتاع عن استخدام التبغ مهم بدرجة عالية جداً

على مقياس متسلسل من صفر إلى مئة، ما مقدار ثقتك بقدرتك على الإمتاع عن استخدام التبغ، مثلاً عندما تقضى وقتاً مع أصدقائك الذين يستخدمون التبغ؟

0 10 20 30 40 50 60 70 80 90 100

مقدار الثقة (1)

هل هناك أحد من أصدقائك المقربين يستخدم أي من منتجات التبغ؟

(1) لا
(2) نعم
هل هناك أحد من أقربائك (زوج أو زوجة، والدين، إخوة، أخوات، أبناء، بنات) يستخدم أيًا من منتجات التبغ؟

لا (1) ☐
نعم (2) ☐

أصدقائي يعتقدون أن استخدام المواد التبغية هو أمر

مرفوض مطلقاً (1) ☐
غير مستحب (2) ☐
اختياري (3) ☐
مستحب (4) ☐
مستحب جداً (5) ☐

أفراد عائلتي يعتقدون أن استخدام المواد التبغية هو أمر

مرفوض مطلقاً (1) ☐
غير مستحب (2) ☐
اختياري (3) ☐
مستحب (4) ☐
مستحب جداً (5) ☐
أي من العبارات التالية صحيحة فيما يتعلق باستخدام المنتجات التبغية داخل البيت؟

- استخدام المواد التبغية ممنوع داخل البيت (1)
- استخدام المواد التبغية مسموح في أجزاء من البيت أو في بعض الأوقات (2)
- استخدام المواد التبغية مسموح في جميع أنحاء البيت (3)

خلال آخر 12 شهرًا، هل سألت طبيبًا أو أي متخصص بالرعاية الصحية عن استخدامك أو عدم استخدامك للمواد التبغية؟

- لا (1)
- نعم (2)

يتناول القسم الثاني من هذا الاستبيان موضوع تدخين السجائر ومحاولات الإقلاع عن استخدام السجائر. رجاءً أجب اعتمادًا على معتقداتك أو سلوكك، وليس هناك إجابات صحيحة أو خاطئة.

خلال الأشهر العشرة الماضية، كم مرة حاولت أن تتمتع بعدخين لمدة يوم واحد أو أكثر من يوم، لأنك تريد أن تقلع نهائياً عن التدخين؟

بالمتوسط، كم سجارة تدخن يومياً؟
بشكل عام، ما الاحتمال أن الإقلاع عن تدخين السجائر سيؤدي إلى تقليل فرص حدوث الأمراض أو الموت؟

- احتمال أكثر من 80 بالمئة (1)
- بين الـ 60% و الـ 80 بالمئة (2)
- بين الـ 40% و الـ 60 بالمئة (3)
- بين الـ 20% و الـ 40 بالمئة (4)
- احتمال أقل من 20 بالمئة (5)

باعتقادك، بأي مقدار سنتحسن صحتك بالإقلاع عن تدخين السجائر؟

- لن يكون هناك أي تحسن (1)
- مقدار ضئيل من التحسن (2)
- مقدار متوسط من التحسن (3)
- مقدار كبير من التحسن (4)
- مقدار هائل جداً من التحسن (5)
يشكل عامً، ما رأيك بالإقلاع عن تدخين السجائر؟

(1) فكرة سيئة جداً
(2) فكرة سيئة
(3) فكرة ليست سيئة ولا جيدة
(4) فكرة جيدة
(5) فكرة جيدة جداً

بالنسبة لك، ما أهمية الإقلاع عن تدخين السجائر وعيش لمدة أطول؟

(1) الإقلاع عن تدخين السجائر وعيش لمدة أطول ليس بالشيء المهم إطلاقاً
(2) الإقلاع عن تدخين السجائر وعيش لمدة أطول مهم قليلاً
(3) الإقلاع عن تدخين السجائر وعيش لمدة أطول مهم بدرجة متوسطة
(4) الإقلاع عن تدخين السجائر وعيش لمدة أطول مهم بدرجة عالية
(5) الإقلاع عن تدخين السجائر وعيش لمدة أطول مهم بدرجة عالية جداً

على مقياس متسلسل من صفر إلى مئة، ما مقدار الثقة بقدرتك على الإقلاع النهائي عن تدخين السجائر خلال الستة أشهر القادمة، إن قررت فعل ذلك؟

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هل كان أحد من أصدقائك المقربين مدختنا في الماضي؟

أصدقائي

1. لا
2. نعم

بالنسبة إلى أقربائك من الدرجة الأولى (زوج أو زوجة، والدين، إخوة، أخوات، أبناء، بنات) هل كان أيًا منهم مدختنا في الماضي؟

1. لا
2. نعم

أصدقائي يعتقدون أن الإقلاع عن التدخين هو أمر:

1. مرفوض مطلقاً
2. غير مستحب
3. اختياري
4. مستحب
5. مستحب جداً
28 أفراد عائلتي يعتقدون أن الإقلاع عن التدخين هو أمر:

- مرفوض مطلقاً (1)
- غير مستحب (2)
- اختياري (3)
- مستحب (4)
- مستحب جداً (5)

29 خلال آخر 12 شهراً، هل سألت طبيب أو أي متخصص بالرعاية الصحية، عن الإقلاع عن التدخين السجائر؟

- لا (1)
- نعم (2)

30 أي من المنتجات التالية استخدمت خلال آخر 12 شهراً لمحاولة الإقلاع عن التدخين) أشر إلى جميع ما ينطبق من الإجابات؟

- معالجة النيكوتين بالإعاضة (علكة النيكوتين، لاصقة الجلد، حبوب الفم رشاش النيكوتين، بخاخ النيكوتين) (1)
- أدوية بوصفة طبية مثل ولبيوترین س ر، تشانتكس (2)
- نصح و إرشاد أو علاج سلوكي (3)
- حاولت الإقلاع عن التدخين بدون أي وسائل مساعدة (4)
After waking up, how much time passes before you light your first cigarette?

- Five minutes or less (1)
- Between 6 minutes and 30 minutes (2)
- Between 31 minutes and 60 minutes (3)
- More than an hour (4)

IA3

The few questions that follow relate to chest imaging of the main or paratracheal group, which is used to form a body part in the internal body. Please answer based on your personal information.

IA32

Have you ever performed chest imaging using the low-dose single-plane X-ray method, which is known as chest imaging of the main, and is an early detection method of lung cancer?

- No (1)
- Yes (2)

IA33

Have you ever performed chest imaging using low-dose single-plane X-ray method?
كم مضى على إجراء ذلك الفحص (بالسنوات والأشهر)؟

هل لديك رغبة في إجراء مسح للرئتين للكشف عن السرطان، إذا أتيحت لك الفرصة لعمل ذلك مجانا؟

لا (1)  
نعم (2)

المسح الرئوي هو إجراء كاف للوقاية من سرطان الرئة:

خطأ (2)  
صواب (3)

المسح الرئوي هو فحص آمن، ولا يصاحبه أي أخطار صحية:

خطأ (1)  
صواب (2)

يجب على جميع مدمني السجائر فحص الرئتين عن طريق التصوير المقطعي ذي الجرعة القليلة، بغض النظر عن أعمارهم

خطأ (1)  
صواب (2)
باعتقادك، بأي مقدار ستتحسن صحتك بإجراء المسح الرئوي عن طريق التصوير المقطعي ذي الجرعة القليلة؟

- لن يكون هناك أي تحسن (1)
- مقدار ضئيل من التحسن (2)
- مقدار متوسط من التحسن (3)
- مقدار مرتفع من التحسن (4)
- مقدار هائل من التحسن (5)

يشكل عاماً، ما رأيك بالمسح الرئوي عن طريق التصوير المقطعي ذي الجرعة القليلة؟

- فكرة سيئة جداً (1)
- فكرة سيئة (2)
- فكرة ليست سيئة ولا جيدة (3)
- فكرة جيدة (4)
- فكرة جيدة جداً (5)
بالنسبة لك، ما أهمية إجراء المسح الرئوي عن طريق التصوير المقطعي ذي الجرعة القليلة؟

1. إجراء هذا المسح الرئوي ليس بالشيء المهم إطلاقاً (1)
2. إجراء هذا المسح الرئوي مهم قليلاً (2)
3. إجراء هذا المسح الرئوي مهم بدرجة متوسطة (3)
4. إجراء هذا المسح الرئوي مهم بدرجة عالية (4)
5. إجراء هذا المسح الرئوي مهم بدرجة عالية جداً (5)

نظام مقياس يمتد من صفر إلى مئة لقياس مستوى الثقة. ما مقدار ثقتك على حجز موعد إجراء المسح الرئوي عن طريق التصوير المقطعي ذي الجرعة القليلة؟

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هل قام أحد من أصدقائك بإجراء فحص المسح الرئوي عن طريق التصوير المقطعي ذي الجرعة القليلة؟

1. لا (1)
2. نعم (2)
هل قام أحد من أقربائك من الدرجة الأولى (زوج أو زوجة، والدين، أخوة، أبناء، بنات) بإجراء فحص المسح الرئوي، عن طريق التصوير المقطعي الذي الجرعة القليلة؟

لا (1) 
نعم (2)

أصدقائي يعتقدون أن فحص المسح الرئوي هو:

مرفوض مطلقاً (1)
غير مستحب (2)
اختياري (3)
مستحب (4)
مستحب جداً (5)

أفراد عائلتي يعتقدون أن فحص المسح الرئوي هو:

مرفوض مطلقاً (1)
غير مستحب (2)
اختياري (3)
مستحب (4)
مستحب جداً (6)
خلال آخر 12 شهراً، هل سألت طبيب أو أي متخصص بالرعاية الصحية، عن فحص المسح الرئوي

(2) لا
(3) نعم

تتطرق الأسئلة القليلة القادمة لمواضيع استخدام اللغة ونظرة شخصية، والاعتقادات والمعارضات الدينية. رجاءً أجب اعتماداً على اعتقاداتك وسلوكياتك، ليس هناك إجابات صحيحة أو إجابات خاطئة.

ما اللغة التي تفضل استخدامها؟
(1) الإنجليزية
(2) لغة عائلتي الأصلية

إذا احتجت أن تختار بين الخيارين التاليين، هل تقول بانك:
(1) أمريكي
(2) من نسل أو عرق عائلتي الأصلية
ما مقدار ارتياحك لأماكن العبادة، أو الاجتماعات دينيًا؟

لا أذهب هناك أبداً (1)
مرة سنوياً، أو أقل من ذلك (2)
بضع مرات بالسنة (3)
بضع مرات بالشهر (4)
مرة أسبوعياً (5)
أكثر من مرة أسبوعياً (7)

ما مقدار حضورك لصلوات الجماعة، أو حلقات الذكر؟
لا أذهب هناك أبداً، أو أذهب أحياناً قليلاً (1)
مرات عديدة شهرياً (2)
مرة أسبوعياً (3)
مرتين أو أكثر أسبوعياً (4)
يومياً (5)
أكثر من مرة باليوم الواحد (6)
في حياتي، أنا أستشعر وجود الله 

كلا على الإطلاق (1) 
غالباً ليس صحيحاً (2) 
لست متأكدًا (3) 
غالباً صحيحاً (4) 
نعم، صحيح تمامًا (5) 

اعتقاداتي الدينية تحدد أسلوبي في الحياة 

كلا على الإطلاق (1) 
غالباً ليس صحيحاً (2) 
لست متأكدًا (3) 
غالباً صحيحاً (4) 
نعم، صحيح تمامًا (5)
أحاول قدر استطاعتي أن أطبق تعاليم ديني في جميع نواحي الحياة

(1) كلا على الإطلاق
(2) غالبا ليس صحيحا
(3) لست متأكد
(4) غالبا صحيحا
(5) نعم، صحيح تماما

هذا هو القسم الأخير من الاستبيان. تتطرق الأسئلة القادمة لموضوع صفاتك الشخصية. ليس هناك إجابات صحيحة أو إجابات خاطئة. رجاء أجب بناءاً على معرفتك الشخصية

الرجاء تحديد الجنس:

(1) ذكر
(2) أنثى

ما سنك (بالسنوات)؟
ما هي سلالتك العرقية؟

- من الهنود الحمر، أو سكان ألاسكا الأصليين (1)
- أسوي (2)
- أمريكي من أصل أفريقي (3)
- من جزيرة هاواي أو أي جزر أخرى في المحيط الهادئ (4)
- أمريكي من أصل أوربي (5)
- أكثر من سلالة واحدة (6)
- سلالة أخرى. الرجاء التحديد (7)

هل أنت من أصل لاتيني؟

- لا (2)
- نعم (3)

في أي دولة تسكن؟

- في الولايات المتحدة الأمريكية (1)
- في دولة أخرى. الرجاء تحديد (2)

في أي ولاية تسكن؟
A61: أين قضيت طفولتك؟

- خارج الولايات المتحدة الأمريكية (1)
- معظم طفولتي كانت خارج الولايات المتحدة الأمريكية (2)
- معظم طفولتي كانت داخل الولايات المتحدة الأمريكية (3)
- فقط داخل الولايات المتحدة الأمريكية (4)

A62: إذا كنت مهاجراً، ابن مهاجر، أو حفيد مهاجر، من أي دولة هاجر، أو هاجر والداك، أو هاجر أجدادك؟

A63: إلى أي جيل من المهاجرين تنتمي؟

- الجيل الأول: مولود خارج الولايات المتحدة الأمريكية (1)
- الجيل الثاني: مولود في الولايات المتحدة الأمريكية، ولكن أحد الوالدين أو كلاهما مولود خارج الولايات المتحدة الأمريكية (2)
- الجيل الثالث: مولود في الولايات المتحدة الأمريكية لأبوين مولودين في الولايات المتحدة الأمريكية (3)
ما هي دينك؟

(1) الإسلام
(2) البروتستانتية
(3) الرومانية الكاثوليكية
(4) المورمونية
(5) الأرثوذكسية الشرقية
(6) الهندوسية
(7) اليهودية
(8) البوذية
(9) الكونفوشيوسية
(10) الطاوية
(11) الإلحاد
(12) اللاازدرية
(13) لا شيء بالتحديد

أفضل أن لا أجب على هذا السؤال (14)

شيء آخر. الرجاء التحديد (15)
إذا كنت مسلماً، أي مذهب تتبع؟

المذهب السنوي (1) 
المذهب الشيعي (2) 
لا أتبع مذهبًا محدداً (3) 
شيء آخر. الرجاء التحديد (4) 

هل سبق وأن غيرت دينك في الماضي؟

لا (1) 
نعم (2) 

كم كان عمرك عندما اعترفت بالدين الذي تعتقد به حالياً؟
إذا، ما هي حالتك الاجتماعية؟

(1) متزوج (2) غير متزوج، ولكن مرتبط
(3) مطلق (4) أرمل
(5) منفصل (6) أعزب
ما هو أعلى مستوى تعليمي لك؟

- ليس هناك أي تعليم (1)
- الصف الأول (2)
- الصف الثاني (3)
- الصف الثالث (4)
- الصف الرابع (5)
- الصف الخامس (6)
- الصف السادس (7)
- الصف السابع (8)
- الصف الثامن (9)
- الصف التاسع (10)
- الصف العاشر (11)
- الصف الحادي عشر (12)
- الصف الثاني عشر (13)
- اختبار تطوير التعليم العام (14)
- أقل من سنة في المعاهد الصناعية أو التجارية أو المهنية (15)
- أكثر من سنة في المعاهد الصناعية أو التجارية أو المهنية، ولكن لم تخرج (16)
- خريج معهد صناعي أو تجاري أو مهني (17)
- شهادة البكالوريوس (18)
- شهادة البكالوريوس (19)
١٠٠
شهادة الماجستير (٢٠) ٠
طب عام ، طب أسنان ، دكتور صيدلة ، محامي (٢١) ٠
دكتورة (٢٢) ٠
غير ذلك . الرجاء تحديد (٢٣) ٠

ما هي حالتك الوظيفية؟ 

موظف (١) ٠
عاطل عن العمل (٢) ٠
ربة بيت (٣) ٠
طالب (٤) ٠
متقاعد (٥) ٠
 ذو إعاقة عامة عن العمل (٦) ٠
غير ذلك . الرجاء التحديد (٧) ٠
نظراً إلى السنة الفائتة، كم كان دخل أسرتك قبل تحصيل الضرائب:

- أقل من عشرة آلاف دولار سنوياً (1)
- بين 10,000 دولار و 14,999 دولار سنوياً (2)
- بين 15,000 دولار و 19,999 دولار سنوياً (3)
- بين 20,000 دولار و 24,999 دولار سنوياً (4)
- بين 25,000 دولار و 29,999 دولار سنوياً (5)
- بين 30,000 دولار و 34,999 دولار سنوياً (6)
- بين 35,000 دولار و 39,999 دولار سنوياً (7)
- بين 40,000 دولار و 44,999 دولار سنوياً (8)
- دخل أسرتي كان 200,000 دولار أو أكثر سنوياً (9)

هل لديك تأمين صحي؟

- لا (1)
- نعم (2)
هل أصبت يوماً ما بسرطان الرئة؟

(1) لا ☐
(2) نعم ☐

كيف ترى مستوى صحتك اليوم؟

(2) ضعيف ☐
(3) مقبول ☐
(4) جيد ☐
(5) جيد جداً ☐
(6) ممتاز ☐

سجلت إجاباتك بنجاح. شكراً لتقاطعك جزء من وقتك لهذا الاستبيان. للمشاركة في فرصة للحصول على إحدى ثلاث بطاقات بقيمة 50 دولاراً، رجاءً انتقل للصفحة التالية. سوف توجه إلى موقع آخر لتسجيل بريدك الإلكتروني. سوف نتواصل معك لاحقاً إذا كنت من الثلاثة الذين سيعتمدون عشوائياً.

لن يكون لبريدك الإلكتروني أي علاقة بإجاباتك. سيحفظ بريدك الإلكتروني و إجاباتك لهذا الاستبيان في ملفين منفصلين.

End of Block: Block A12

Start of Block: Block A13

End of Block: Block A13

Start of Block: Block F0
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��维吉尼亚大学
Office of Research Integrity & Compliance

الدكتورة د. أ. إيلينك كيلي، دكتوراه في أمراض الدوائية، من جامعة "الدكتور" د. أ. إيلينك كيلي، دكتوراه في أمراض الدوائية، من جامعة...
من مأمور به شرکت در این پرسشنامه هستم:

○ بله (1)
○ خیر (2)

End of Block: Block F0

Start of Block: Block F1

هدف از این پرسشنامه بررسی نظر شما درباره مصرف دخانیات و تست ریه می‌باشد. بخش اول پرسشنامه درباره عقاید و رفتار خودتان است. هیچ جوابی درست یا غلط نیست.


اگر شما در طول عمر خود حداقل یکصد سیگار کشیده‌اید؟

○ خیر (1)
○ بله (2)

در حال حاضر چند وقت یکبار سیگار می‌کشیدید؟

○ هر گز (1)
○ بعضی روزها (2)
○ هر روز (3)
کدامیک از محصولات زیر را تا کنون مصرف کرده اید، حتی برای یکبار؟ لطفا همه موارد را مشخص کنید.

- سیگار (1)
- قلمیان (انواع مختلف با مزه‌های مختلف تنباکو) (2)
- نام (پک‌سیگار گیاهی است) (3)
- سیگار الکترونیکی (انواع گوناگون) (4)
- قافی (پک جور گیاه است) (5)
- سیگار باریک و دست ساز که در برگ درخت بچه‌های شده (6)
- سیگار با طعم میوه (7)
- اداس می‌سیگار یا اداس دارای نیکوتین (8)
- سیگار برگ (9)
- سیگار با درصد کمتر تنباکو (10)
- سیگار هندی (11)
- بی‌پی (12)
- سیگار معمولی (13)
- بی‌پی (14)

یا دیگر محصولات مرتبط با دخانیات (لطفا ذکر شوید) (15)

من هیچ کدام از این محصولات را استفاده نمی‌کنم (16)

در طول سه روز گذشته، ایا شما از محصولاتی که در بالا اشاره شد مصرف نموده اید؟

- خیر (1)
- یا (2)
چه مدت یک بار دخانیات مصرف می‌کنید؟

○ بیش از یک بار در روز (1)
○ روزی یک بار (2)
○ چند بار در هفته (3)
○ یک بار در هفته (4)
○ دو یا 3 بار در هفته (5)
○ یکبار در هفته (6)
○ هر چند ماه یکبار، یا کمتر (7)

در چه سنی مصرف دخانیات را به طور منظم می‌پذیرید؟

---

چقدر احتمال دارد که مصرف دخانیات به طور کلی، منجر به بیماری‌های مرگ‌زا شود؟

○ احتمالا بیشتر از ۸۰ درصد (1)
○ احتمالا بین ۴۰ تا ۶۰ درصد (2)
○ احتمالا بین ۴۰ تا ۶۰ درصد (3)
○ احتمالا بین ۲۰ تا ۴۰ درصد (4)
○ احتمالا کمتر از ۲۰ درصد (5)

End of Block: Block F1
اگر دخانیات مصرف می‌کردید، فکر می‌کنید تا چه میزان سلامت شما تحت تاثیر می‌باود؟

- هرگز (1)
- بسیار کم (2)
- کم (3)
- زیاد (4)
- بسیار زیاد (5)

نظر کلی شما در ارتباط با مصرف دخانیات چیست؟

- بسیار بد است (1)
- بد است (2)
- بد نیست یا خوب نیست (3)
- خوب است (4)
- بسیار خوب است (5)
برای شما چقدر مهم است که از دخانیات پرهیز کنید؟

| 1 | اصلا مهم نیست |
| 2 | کمی مهم است |
| 3 | متوسط مهم است |
| 4 | خیلی مهم است |
| 5 | بسیار مهم است |

در میان بهترین دوستان شما ایا حداقل یک نفر دخانیات مصرف می‌کند؟

| 1 | خیر |
| 2 | نه |

در مقياس ۰% تا ۱۰۰% چقدر مطمئن هستید که می‌توانید از دخانیات پرهیز کنید؟ برای مثال وقتی در کنار دوستان هستید.

<table>
<thead>
<tr>
<th>درجه قطعیت</th>
<th>0 10 20 30 40 50 60 70 80 90 100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

End of Block: Block 30

Start of Block: Block F3

در میان بهترین دوستان شما ایا حداقل یک نفر دخانیات مصرف می‌کند؟

| 1 | خیر |
| 2 | نه |
در میان فامیل درجه یک شما (همسر، والدین، برادر، خواهر، پسرها، دخترها) آیا حداقل یک نفر مصرف کننده دخانیات وجود دارد؟

<table>
<thead>
<tr>
<th></th>
<th>خیر (1)</th>
<th></th>
<th>بله (2)</th>
</tr>
</thead>
</table>

دوستان من فکر می کنند که استفاده از دخانیات؟

<table>
<thead>
<tr>
<th></th>
<th>کاملا نامناسب است (1)</th>
<th></th>
<th>کمی نامناسب است (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>تیره هستند (3)</td>
<td></td>
<td>کمی مناسب است (4)</td>
</tr>
<tr>
<td></td>
<td>کاملا مناسب است (5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

افراد خانواده من معتقد هستند که استفاده از دخانیات

<table>
<thead>
<tr>
<th></th>
<th>کاملا نامناسب است (1)</th>
<th></th>
<th>کمی نامناسب است (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>تیره هستند (3)</td>
<td></td>
<td>کمی مناسب است (4)</td>
</tr>
<tr>
<td></td>
<td>کاملا مناسب است (5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
کدامیک از جملات زیر به خوبی قوانین در مورد مصرف دخانیات در خانه شما را مشخص می‌کند؟

- استفاده از دخانیات در داخل خانه ممنوع می‌باشد (1)
- استفاده از دخانیات در داخل خانه گاهی اوقات یا در برخی قسمت‌های خانه مجاز است (2)
- استفاده از دخانیات در تمام اوقات مجاز می‌باشد (3)

ایا در طول دوازده ماه گذشته مصرف دخانیات شما، به‌شکلی که در حضوره سلامت فعالیت داشته‌اید، از شما در مورد مصرف دخانیات سوال کرده‌اید؟

- خیر (1)
- بله (2)

بخش دوم از پرسشنامه در مورد سیگار کشیدن و تلاش برای ترک سیگار است. لطفاً بر اساس اعتقادات و رفتار خود پاسخ دهید. هیچ پاسخ درست یا نادرست وجود ندارد.

اگر که شما مصرف سیگار یا سایر محصولات مرتبط با تنباکو هستید، در طول دوازده ماه گذشته، چند بار تلاش کردن کشیدن دخانیات را کنار گذاشته‌اید که تنباکو روزی یک یا بیشتر با طوریکه کلا سیگار را ترک کنید؟
به طور متوسط، اگر شما سیگار می‌کشیدند چند عدد سیگار در روز مصرف می‌کنید؟

راهکار: 

چقدر احتمال دارد که ترک سیگار به طور کلی، شانس مبتلا شدن به بیماری‌ها را کاهش بدهد؟

- احتمالاً بیشتر از 80 درصد (1)
- احتمالاً بین 60% تا 80% درصد (2)
- احتمالاً بین 40% تا 60% درصد (3)
- احتمالاً بین 20% تا 40% درصد (4)
- احتمالاً کم‌تر از 20 درصد (5)

چقدر شما فکر می‌کنید آن را به سلامت شما بهره‌مند شوند اگر شما به ترک سیگار کشیدن؟

- هرگز (1)
- بسیار کم (2)
- کم (3)
- زیاد (4)
- بسیار زیاد (5)
نظر کلی خود را از ترک سیگار چیست؟

○ بسیار بد است (1)
○ بد است (2)
○ بد نیست یا خوب نیست (3)
○ خوب است (4)
○ بسیار خوب است (5)

برای شما، اهمیت ترک سیگار و زندگی طولانی تر کردن چیست؟

○ اصلا مهم نیست (1)
○ کمی مهم است (2)
○ متوسط مهم است (3)
○ خیلی مهم است (4)
○ بسیار مهم است (5)

در مقیاس 0 تا 100 درصد، چقدر مطمئن هستید که اگر بخواهید میتوانید در شش ماه آینده کاملا سیگار را ترک کنید؟

درجه قطعیت (1)
ایا در بین بهترین دوستان شما حداقل یک نفر که قبلا گیگار می‌کشیده وجود دارد؟

(1) خیر
(2) بله

ایا در بین اقوام درج یک شما، شوهر، والدین، برادران، خواهران، پسران، دختران (حداقل یک نفر که قبلا گیگار می‌کشیده وجود دارد؟

(1) خیر
(2) بله

دوستان من معتقد هستن که کنار گذاشتن دخانیات

(1) کاملاً نامناسب است
(2) کمی نامناسب است
(3) تا طرف هستند
(4) کمی مناسب است
(5) کاملاً مناسب است
افراد خانواده من فکر می‌کنند که گذاشتن دخانیات

(1) کاملاً مناسب است
(2) کمی مناسب است
(3) بی‌طرف هستند
(4) کمی مناسب است
(5) کاملاً مناسب است

ایا در طول دوازده ماه گذشته، دکتر یا شخصی که در حوضه سلامت فعالیت داشته باشد از شما در مورد ترک دخانیات سوال کرده است؟

(1) خیر
(2) پلا

اگر شما دخانیات مصرف می‌کنید، کدامیک از موارد زیر برای ترک کردن مورد استفاده قرار داده‌اید؟ (لطفا تمام موارد را مشخص کنید)

(1) جایگزین های نیکوتین (مانند: ادامس، برچسب، زل، اسپری استنشاقی
(2) نسخه‌ای پزشکی مانند (Wellbutrin SR، Chantix
(3) مشورت یا مشاوره روانی و ذهنی
(4) تلاش برای ترک بدون هیچ کمک یا پویار انفرادی
اگر شما مصرف کننده‌های سیگار هستید، در چه وقت بعد از این که از خواب بلند شدید اولین سیگار را می‌کشید؟

- در حدود یک دقیقه (1)
- بین سی و یک تا شصت دقیقه (2)
- بین شصت تا سی دقیقه (3)
- بیشتر از شصت دقیقه (4)

برای تشخیص سرطان ریه شنیده‌اید؟

- خیر (1)
- بله (2)

آیا شما تاکنون تحت معاینه (LDCT) Low-dose computed tomography گرفته‌اید؟

- خیر (1)
- بله (2)
آخرين بار كه شما معاينه برای تشخيص سرطان ریه انجام دادید کی بوده است؟

آیا متأمل به انجام تست سرطان ریه، در صورت دسترسی کامل رایگان، هستید؟

(1) خیر (2) نه

آیا تشخيص سرطان ریه کافی می باشد تا از سرطان ریه جلوگیری شود؟

(1) غلط (2) درست

آیا معاینه و تست ریه برای تشخيص سرطان بی خطر است

(1) غلط (2) درست
تمام افراد سیگاری باید بدون نظر گرفتن سن، تحت معاینه برای تشخیص سرطان ریه قرار بگیرند

(1) غلط

(2) درست

---

چقدر شما فکر می‌کنید آن را به سلامت شما بهره‌مند شود؟ اگر شما به ریه غربالگری با استفاده از دوز پايين توموگرافی کامپیوتری، همچنین به عنوان شناخته شده CT اسکن و یا CAT اسکن، و یا

(1) هر چه زیاد‌تر

(2) مسیر کم

(3) کم

(4) زیاد

(5) بسیار زیاد
نظر کلی شما در رابطه با تست ریه با استفاده از دوز پايين توموگرافی، که به آن سی تی اسکن یا کات اسکن هم می‌گویند، چیست؟

○ بسیار بد است (1)

○ بد است (2)

○ بد نیست یا خوب نیست (3)

○ خوب است (4)

○ بسیار خوب است (5)

چقدر برای شما مهم است که تست ریه از طریق دوز پايين توموگرافی (که به آن سی تی اسکن یا کات اسکن هم می‌گویند) انجام دهید؟

○ اصلا مهم نیست (1)

○ کمی مهم است (2)

○ متوسط مهم است (3)

○ خیلی مهم است (4)

○ بسیار مهم است (5)

در مقیاس از 0% تا 100%، چقدر مطمئن هستید که میتوانید در شیش ماه آینده نوبت سی تی اسکن ریه بگیرید؟

درجه قطعیت (1)

درجه قطعیت (2)
End of Block: Block F8

Start of Block: Block F9

ایا در بین دوستان نزدیک شما، حداقل یک نفر مورد تست ریه قرار گرفته است؟

○ خیر (1)
○ بله (2)

- با توجه به اقوام درج یک شما، شوهر، والدین، برادرها، خواهرها، پسرها، دخترها (حداقل یک نفر مورد تست ریه قرار گرفته است؟

○ خیر (1)
○ بله (2)

دوستان من معقید هستند که معاینه ریه

○ کاملاً مناسب است (1)
○ کمی مناسب است (2)
○ بی طرف هستند (3)
○ کمی مناسب است (4)
○ کاملاً مناسب است (5)
افراد خانواده من معتقد هستند که معاونیت ریه
(1) کاملاً نامناسب است
(2) کمی نامناسب است
(3) بیطرف هستند
(4) کمی مناسب است
(5) کاملاً مناسب است

ایا در طول دوازده ماه گذشته، دکتر یا شخصی به کیهان دهیتی فعالیت باشد از شما در مورد معاونیت ریه سوال کرده است؟
(1) خیر
(2) بلی

اگر سوال بعدی در رابطه با زبان، هویت، باورها و رفتار مذهبی شما است لطفاً بر اساس اعتقادات و رفتار خودتان پاسخ دهید. هیچ جوابی درست یا غلط نیست.

به چه زبانی علاقه‌مند هستید صحبت کنید؟
(1) زبان انگلیسی
(2) زبان مادری
شما خود را به عنوان کدام ملیت می‌شناسید؟

امericایی (1)

ملیت مادری (2)

هرچند وقت یکبار در محل‌های عبادت مانند مسجد و غیره حاضر می‌شوید؟

۱) هر چند (1)

یک بار در طی سال (2)

۲) دفعات محدودی در طی سال (3)

۳) دفعات محدودی در طی ماه (4)

یک بار در هفته (5)

۴) بیش از یک بار در هفته (6)
هرچند وقت زمانی را برای فعالیت‌های مذهبی شخصی نظر نماید، دعا یا قرآن یادگیری مذهب‌اختصاصی می‌دهید؟

<table>
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<th>پاسخ</th>
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<td>بندرت یا هرکنز (۱)</td>
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<td>دفعات محدودی در ماه (۲)</td>
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<td>یک بار در هفته (۳)</td>
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<td>6</td>
<td>بیش از یک بار در روز (۶)</td>
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در زندگی ام حضور خداوند را تجربه می‌کنم.

<table>
<thead>
<tr>
<th>رقم</th>
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<tbody>
<tr>
<td>1</td>
<td>اصلاً صحیح نیست (۱)</td>
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<td>تا حدودی صحیح است (۴)</td>
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<td>5</td>
<td>کاملاً در مورد من صحیح است (۵)</td>
</tr>
</tbody>
</table>
عقاید مذهبی من واقعا همان چیزی است که درپشت دیدگاه کلی من به زندگی قرار دارد.

1. اصلا صحیح نیست
2. تا حدودی صحیح نیست
3. مطمئن نیستم
4. تا حدودی صحیح است
5. کاملا در مورد من صحیح است

من به سختی تلاش می کنم مذهب را به همه امور زندگی ام انتقال دهم.

1. اصلا صحیح نیست
2. تا حدودی صحیح نیست
3. مطمئن نیستم
4. تا حدودی صحیح است
5. کاملا در مورد من صحیح است

اورا باید به همه سوالات پاسخ دهید.

1. بهترین راه برای پاسخ دادن به سوالات پرسشنامه است.
2. بهترین راه برای پاسخ دادن به سوالات پرسشنامه است.
3. بهترین راه برای پاسخ دادن به سوالات پرسشنامه است.
4. بهترین راه برای پاسخ دادن به سوالات پرسشنامه است.
5. بهترین راه برای پاسخ دادن به سوالات پرسشنامه است.

End of Block: Block F9

Start of Block: Block F10

ادبای دیگر نمی توانیم با پرسشنامه است. چند سوال بعدی در موردی که هیچ جوابی درست یا غلط نیست و

اطلاعات شخصی خودتان باشگاه دید کنید.
جنسيت خود را مشخص کنید:

 مرد (1) ☐

 زن (2) ☐

 سن خود را بیان کنید؟

 امریکای هندی/بومی‌الاسکا (1) ☐

 اسیایی (3) ☐

 امریکای افریقایی (6) ☐

 وی هاوایی/سایر سواحل اقیانوس آرام (5) ☐

 سفید (7) ☐

 جند نژادی (2) ☐

 سایر موارد بعلت ذکر شود (4) ☐
ایا نژاد شما سپانیه‌ای یا لاتین است؟ لطفا یک مورد را انتخاب کنید.

خیر (1) ☐

بلی (2) ☐

در کدام کشور زندگی می‌کنید؟

در ایالت‌های متحد امریکا (4) ☐

در جای دیگر، لطفاً نظر شما ذکر شود (5) ____________________________________________ ☐

در کدام ایالت‌های زندگی می‌کنید؟


در کدام محل یا منطقه‌ای زندگی اید؟

در خارج از ایالت‌های متحد امریکا (4) ☐

بیشتر در خارج از ایالت‌های متحد امریکا (5) ☐

بیشتر در امریکا (3) ☐

فقط در امریکا (2) ☐

اگر شما مهاجر هستید یا پسر و دختر یک مهاجر هستید و یا نوه یک مهاجر اصلی‌اودا به کدام کشور تعلق دارید؟
به کدامیک از گروه‌های مهاجر کننده تعلق دارید؟

- نسل اول: به دنیا امده در خارج از آمریکا (1)
- نسل دوم: به دنیا امده در داخل آمریکا، حداقل یکی از والدین خارجی می‌باشد (2)
- نسل سوم: به بعد به دنیا امده در آمریکا، از پدر و مادری که آمریکا به دنیا آمد (3)
پیرو کدام مذهب می‌باشید، اگر از مذهب خاصی پیرو می‌کنید؟

1. اسلام
2. پروتستان
3. کاتالویک رومی
4. مرمون
5. اورتدوکس
6. هندر
7. نورسی
8. بودایی
9. کنفوسیوس
10. مذهب چینی
11. کافر
12. لادنی گری
13. مذهب خاصی خودی
14. تمایل به جواب ندارم
15. مورد دیگری لطفاً ذکر کنید
اگر شما مسلمان هستید، پیرو کدامیک از فرقه‌های زیر هستید؟ لطفاً تمام موارد را مشخص کنید؟

(1) سنی

(2) شیعه

(3) مورد خاصی نیست

(4) سایر موارد: لطفاً ذکر شود

یا اگر شما تا حال دین خود را عوض کرده اید؟

(1) خیر

(2) بله

اگر شما دین خود را عوض کرده اید، در چه سنی شما دین خود را عوض کرده اید؟
لطفا شرایط زندگی خود را از بابت ازدواج مشخص کنید؟

(1) ازدواج

(2) طلاق

(3) با همسر یا شوهر زندگی می کنم

(4) بیوه

(5) جدا زندگی می کنم

(6) مجردتا کنون ازدواج نکردم
بی‌الاثری‌ن مدرک تحصیلی شما چیست؟

(1) هیچ

(2) کلاس اول

(3) کلاس دوم

(4) کلاس سوم

(5) کلاس چهارم

(6) کلاس پنجم

(7) کلاس ششم

(8) کلاس هفتم

(9) کلاس هشتم

(10) کلاس نهم

(11) کلاس دهم

(12) کلاس پایان دهه

(13) کلاس دوازدهم

(14) دیپلم از نهضت سود آموزی

(15) کمی از دانشگاه، یا دوره‌های آموزشی زیر یک سال

(16) دوره‌های دانشگاهی بیشتر از یک سال، بدون مدرک

(17) مدرک فنی، تجاری، یا مجوز کار

(18) فوق دیپلم

(19) مدرک کارشناسی (لبیسانت و مهندسی)
مدرک کارشناسی ارشد فوق لیسانس (20)

○

درک پزشکی/ دندانپزشک/ داروساز/ وکیل (21)

○

مدرک دکترا رشته‌های غیر پزشکی (22)

○

سایر موارد: لطفاً ذکر شود (23)

وضعیت شغلی خود را مشخص کنید؟

(1) شاغل

(2) بیکار

(3) خانه‌دار

(4) دانش‌اموز

(5) بازنشسته

(6) نا‌توانی فیزیکی

(7) سایر موارد: لطفاً ذکر شود
در سال گذشته درآمد شما قبل از مالیات در چه حدود می باشد؟

- از ۰ تا ۹۹۹ دلار (1)
- از ۱۰۰۰ تا ۱۳۹۹ دلار (2)
- از ۱۴۰۰ تا ۱۹۹۹ دلار (3)
- از ۲۰۰۰ تا ۲۴۹۹ دلار (4)
- از ۲۵۰۰ تا ۴۹۹۹ دلار (5)
- از ۵۰۰۰ تا ۷۴۹۹ دلار (6)
- از ۷۵۰۰ تا ۹۹۹۹ دلار (7)
- از ۱۰۰۰۰ تا ۱۹۹۹۹ دلار (8)
- بیش از ۲۰۰۰۰ دلار (9)

End of Block: Block F11

Start of Block: Block F12

ایا شما بیمه خدمات درمانی دارید؟

- خیر (1)
- بلی (2)
آیا تا به حال، بر اساس تشخیص دکتر، مبتلا به سرطان ریه بوده‌اید؟

○ خیر (1)
○ بله (2)

سلامت خود را به چه صورت ارزیابی می‌کنید؟

○ ضعیف (1)
○ معمولی (2)
○ خوب (3)
○ خیلی خوب (4)
○ عالی (5)

پاسخ‌های شما ثبت گردید. بخاطر زمان‌کشیدن که گذاشتید سپاسگزاریم.

به منظور شرکت در قرعه کشی هیچ‌کدام از ۵۰ دلاری‌ها، لطفاً به صفحه‌ی بعد بروید. شما به صفحه‌ی دیگری برای وارد کردن مقدار خود متوصل خواهید شد. در صورت پرنه کردن در قرعه‌کشی، با شما تماس خواهیم گرفت.

پاسخ‌های شما به این نظر سنجی با آدرس ایمیلی که وارد می‌کنید مرتبط نخواهد بود و آدرس ایمیل شما و پاسخ‌هایتان در دو فایل جدا战 خیزی‌های خواهید شد.
U0.2
میں اس سوالنامے میں حصہ لینے کے لیے تیار بون

• گھی بان (1)
• نہیں (2)

End of Block: Block U0

Start of Block: Block U1

سوال کا مقصد تمباکو کے استعمال اور پھیلاؤن کی اسکریننگ کے حوالے سے آپ کا نقطہ نظر جانا ہے۔ پہلا
 حصہ تمباکو کے استعمال کے بارے میں ہے۔ اپنے عقائد یا طرز عمل کی بنیاد پر جواب دین۔ کوئی صحیح یا غلط جوابات نہیں
 بین۔

U1
آپ نے اپنی پوری زندگی میں کم از کم 100 سگریٹ نوشی کی بین؟

• نہیں (1)
• گھی بان (2)

U2
کتنی بار اپنی سگریٹ نوشی کرتے بین؟

• بالکل نہیں (1)
• چچھ دن (2)
• پر روز (4)
3. مندرجہ ذیل مصنوعات میں سے آپ نے کیا استعمال کیا ہے؟ (صرف ایک بار) ایسی تمام ملاحظات کریں (1)

- سگریٹ (1)
- حقہ (2)

Snus سے (3)

- الیکٹرانک سگریٹ (4)
- قات (5)
- بیدی (6)
- کریتک (7)

چہنے والا تمباکو (8)

- سگار (9)
- نسوار (10)
- سبقاریلو (11)
- بیری (12)
- بیتال نئٹ (13)
- پنٹ (14)

- دیگر مصنوعات (وضاحت کریں) (15)

4. گزشتہ 30 دنوں کے دوران، آپ نے تمباکو کسی بھی شکل میں استعمال کیا ہے؟

- نہیں (1)
- جی بان (4)
1. How many times do you use tobacco?
   - Once a day (1)
   - Twice a day (2)
   - Twice a day and more (3)
   - Once in a month (4)
   - Once a week or less (5)
   - Twice a week or less (6)

2. What is your age at first regular use of tobacco?

3. Is it possible that tobacco use could be the cause of illness or death?
   - Over 80% (1)
   - 60% - 80% (2)
   - 40% - 60% (3)
   - 20% - 40% (4)
   - Less than 20% (5)
8. تتمباکو کا استعمال آپ کی صحت پر کس حد تک اثرانداز بھی سکتا ہے؟

(1) بالکل نہیں
(2) ایک چھوٹا سا
(3) کسی حد تک
(4) بہت زیادہ
(5) انتہائی

9. تتمباکو کے استعمال کے بارے میں آپ کی مجموعی طور پر کیا رائے ہے؟

(1) تتمباکو کا استعمال بہت برا ہے
(2) تتمباکو کا استعمال برا ہے
(3) تتمباکو کا استعمال برا نہیں اور اچھا نہیں
(4) تتمباکو کا استعمال اچھا ہے
(5) تتمباکو کا استعمال بھی اچھا ہے
10. اپنے اہمیت کے لئے کتنے اہم ہے کہ آپ تیمباکو سے پرہیز کریں؟

○ بالکل ضروری نہیں (1)
○ تہورا اہم (2)
○ اعتدال ضروری (3)
○ بہت اہم (4)
○ انہی تھی اہم (5)

11. ایک صفر فیصد سے 100% کے پیمانے پر، آپ کتنے یقین ہے کہ آپ تیمباکو استعمال کرنے والے دوستوں کے ساتھ وقت گزارتے ہوئے، تیمباکو کی استعمال سے پرہیز کر سکتے ہیں؟

0 10 20 30 40 50 60 70 80 90 100

یقین کی درجہ (4)

End of Block: Block U2

Start of Block: Block U3

12. ایک دوست کے کردنے کے ذریعے تیمباکو کا استعمال کرتا ہے؟

○ نہیں (1)
○ جیہاں (2)

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13 آپ کے خاندان کے ارکان (شريك حييت، والدين، بهائيون، بہنوں، بیٹوں، بہنوں، بے بیٹوں، مین سے کم از کم، ایک ایک) صارف تمباکو استعمال کر تا یا؟

○ نہیں (1)
○ ہے (2)

14 میرے دوستوں کے مطابق تمباکو کی مصنوعات استعمال کرنا:

○ بالکل نامناسب (1)
○ قدرے نامناسب (2)
○ نہ تو نامناسب نہ بی مناسب (3)
○ قدرے مناسب (4)
○ بالکل مناسب (5)

15 میرے خاندان کے رکن کے مطابق تمباکو کی مصنوعات استعمال کرنا:

○ بالکل نامناسب (1)
○ قدرے نامناسب (2)
○ نہ تو نامناسب نہ بی مناسب (3)
○ قدرے مناسب (4)
○ بالکل مناسب (5)

End of Block: Block U3
آپ کے گھر کے اندر تютکو کا استعمال ہیں؟ مین اصل کیا اصول؟

○ تютکو استعمال ہیں؟

○ تютکو کا استعمال ہیں؟ کچھ جگہوں کیا یا کچھ وقت کی اجازت ہے؟

○ تютکو کا استعمال ہیں؟ میرے گھر کے اندر کہیں بھی اجازت ہے؟

ماہ کے دوران، ایک ذاکر یا مبار صحت نے آپ کے تютکو کا استعمال ہیں؟ مین آپ سے بوجھی ہے?

○ نہیں (1)

○ ہاں (2)

سوالنامے کا دوسرا حصہ تютکو نوشٹی اور تютکو نوشٹی جھڑپے نے کی کوشش کے بارے میں آپ سے بوجھی ہے?

○ تھا (1)

○ ہاں (2)

ماہ کے دوران، آپ نے کتنی بار سگریٹ نوشٹی ایک دن یا اس سے زیادہ کے لئے جھڑپے نے کی کوشش کر رہے تھے؟

آپ ایک دن میں کتنی سگریٹ نوشٹی کرتے تھے؟
20. کتنّا امکان ہے کہ تمباکو نوشی نے سے، عالم طور پر، بیماری یا موت کے امکانات کم ہو جائیں گے؟

<table>
<thead>
<tr>
<th>گزینہ</th>
<th>امکانات</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>کا امکان 80 فیصد سے زائد</td>
</tr>
<tr>
<td>2</td>
<td>60% - 80% امکان</td>
</tr>
<tr>
<td>3</td>
<td>40% - 60% امکان</td>
</tr>
<tr>
<td>4</td>
<td>20% - 40% امکان</td>
</tr>
<tr>
<td>5</td>
<td>کم 20% امکان</td>
</tr>
</tbody>
</table>

21. آپ کے خیال میں سگریٹ نوشی نے سے آپ کی صحت کو قائدہ بو گا؟

<table>
<thead>
<tr>
<th>گزینہ</th>
<th>یقین</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>بالکل نہیں</td>
</tr>
<tr>
<td>2</td>
<td>ایک چھوٹا سا</td>
</tr>
<tr>
<td>3</td>
<td>کسی حد تک</td>
</tr>
<tr>
<td>4</td>
<td>بہت زیادہ</td>
</tr>
<tr>
<td>5</td>
<td>انتہائی</td>
</tr>
</tbody>
</table>
تمباکو نوشی کے بارے میں مجموعی طور پر آپ کی کیا رائے ہے؟

<table>
<thead>
<tr>
<th>نمبر</th>
<th>رائے</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>تتمباکو نوشی چھوٹا بیٹے برائے ہے</td>
</tr>
<tr>
<td>2</td>
<td>تتمباکو نوشی چھوٹا ہے</td>
</tr>
<tr>
<td>3</td>
<td>تتمباکو نوشی چھوٹا اور اچھا نہیں ہے</td>
</tr>
<tr>
<td>4</td>
<td>تتمباکو نوشی اچھا ہے</td>
</tr>
<tr>
<td>5</td>
<td>تتمباکو نوشی اچھا بیٹے اچھا ہے</td>
</tr>
</tbody>
</table>

آپ کے لیے کتنا اہم ہے کہ آپ تتمباکو نوشی چھوڑ کر ایک طویل زندگی گزاریں؟

<table>
<thead>
<tr>
<th>نمبر</th>
<th>اہمیت کا درجہ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>بالکل ضروری نہیں</td>
</tr>
<tr>
<td>2</td>
<td>ضرورت ہے</td>
</tr>
<tr>
<td>3</td>
<td>اعتدال ضرورتی</td>
</tr>
<tr>
<td>4</td>
<td>بہت اہم</td>
</tr>
<tr>
<td>5</td>
<td>انتہائی اہم</td>
</tr>
</tbody>
</table>

صفر 100% کے پیمانے پر کیا آپ کو مکمل طور پر نوشی سے ہٹ کر 6 ماه کے دوران میں کامیاب ہو سکتے ہیں؟

<table>
<thead>
<tr>
<th>نمبر</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>شماری</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

یقین کی ذکری (1)
تمہارے سب سے اچھے دوستوں کے درمیان کم از کم ایک سبق سگرث نوش ہے؟

○ نہیں (1)
○ جیہاں (2)

آپ کے خاندان کے ارکان (شریک حیات، والدین، بهائیون، بہنوں، بہنوں، بہنوں، بہنوں، بہنوں) میں سے کم از کم ایک سبق سگرث نوش ہے؟

○ نہیں (1)
○ جیہاں (2)

پولیس کولگنا بے کے تمباکو نوشی چھوڑنا:

○ بالکل نامناسب (1)
○ قدرے نامناسب (2)
○ قدرے نامناسب نہیں مناسب (3)
○ قدرے مناسب (4)
○ بالکل مناسب (5)
28. میرے خاندان کے رکن کو لگتا ہے کہ تیمباکو نوشی چھوڑنا:

○ بالکل نامناسب (1)
○ قدرتی نامناسب (2)
○ نہ تو نامناسب نہ ہی مناسب (3)
○ قدرتی مناسب (4)
○ بالکل مناسب (5)

29. گزشتہ 12 ماہ کے دوران، ذاکر يا دوسرے صحت کے پیش نویف کے بارے میں تیمباکو نوشی چھوڑنے کی بات کی ہے؟

○ نہیں (1)
○ جی ہاں (2)

30. ان طریقے میں سے چوگا کو سگریٹ نوشی چھوڑنے میں مدد کرتے ہیں گزشتہ 12 ماہ کے دوران آپ نے کیاستعمال کیا ہے؟ ایسی تمام چیک کریں (1)

○ نیکوتین تبدیلی: جیسے گم، پچ، جوسنیال، سمندر (1)
○ نسخے کی ادویات: جیسے Wellbutrin SR، Chantix (2)
○ مشاورت (3)
○ کسی کی مدد کے بیغار تیمباکو نوشی چھوڑنے کی کوشش کی (5)
بعد پہلی سگرٹ نوشی کرتے ہیں؟

1. 5 منٹ کے اندر اندر
2. 30-60 منٹ کے اندر اندر
3. 60-120 منٹ کے اندر اندر
4. 60 منٹ کے اندر

اب "لوڈ کبھی کبھی ثومو گرافی کے بارے میں سنا ہیں؟

1. نہیں
2. ہیں

کہا ہے کہ کبھی کبھی برہنے کے لئے لوڈ کبھی کبھی ثومو گرافی کروا لیا ہے؟

1. نہیں
2. ہیں
U34 की किन्नरी दीर्घ पीले आप तक सब से हालामा (लो थोड़ा किए स्क्रीन किन्नर खोज के किन्नर के के लगे चिक करने के

ले क्रोबिया के?

------------------------------------------

U35 प्यूहोह्रो के किन्नर के लेके में फ्लैट इस्क्रीन्क की जा रबी बुटो आप दलजानी ही ने?

○ नहीं (1)
○ जान (2)

------------------------------------------

U36 प्यूहोह्रो के किन्नर के लें फ्लैट इस्क्रीन्क प्यूहोह्रो के किन्नर के खलअ हवाक आप की काफी ही?

○ जान (1)
○ सज (2)

------------------------------------------

U37 प्यूहोह्रो के किन्नर के लें फ्लैट इस्क्रीन्क मॉडे होज़ बी (कम इन हर्य लें) सात नंसके में सीने ही?

○ जान (1)
○ सज (2)
تمام تمباقو نوشی کرنے والی کون کی عمر نظر انداز کرکے پھیپہڑوں کے کینسر کے لئے سکرین کروانی چاہئے۔

جب وت (1)
سج (2)

End of Block: Block U7

Start of Block: Block U8

کیا اپنے کہ سیٹی اسکین کا استعمال کرتے بونے پھیپہڑوں کی اسکریننگ کرنا آپ کی صحت کے لئے فائدہ ماند ہو گا؟

(1) بالگل نہیں
(2) تھوڑا سا
(3) کسی حد تک
(4) بہت زیادہ
(5) انتہائی حد تک
1. اسکریننگ بہت بری ہے (1)
2. اسکریننگ بری ہے (2)
3. اسکریننگ بری نہیں اور اچھی نہیں ہے (3)
4. اسکریننگ اچھی ہے (4)
5. اسکریننگ بہت اچھی ہے (5)

1. بالکل ضروری نہیں (1)
2. نہوں ہے ام (2)
3. کچھ ام (3)
4. بہت ام (4)
5. انتہائی ام (5)

1. یقین کی ڈگری (1)

0 10 20 30 40 50 60 70 80 90 100
34. آپ یک سب سے اچھے دوست مین سے کم از کم ایک نے پھیلہڑوں کی اسکریننگ کروائی؟

○ نہیں (1)
○ جیاں (2)

35. آپ کے خاندان کے ارکان (شريک حیات، والدین، بہنوں، بھانیوں، بیٹوں، بھانیوں، بیٹوں، بیٹوں) میں سے، کم از کم ایک نے پھیلہڑوں کی اسکریننگ کروائی؟

○ نہیں (1)
○ جیاں (2)

36. میرے دوستوں کے مطابق پھیلہڑوں کی اسکریننگ یا:

○ بالکل مناسب (1)
○ قدرے مناسب (2)
○ نہ تو مناسب نہ ہی مناسب (3)
○ قدرے مناسب (4)
○ بالکل مناسب (5)
46 "میرے خاندان کے رکن کو لگتا ہے پھیپہڑوں اسکریننگ کروانا:"

- بالکل نامناسب (1)
- قدرے نامناسب (2)
- نہ تو نامناسب نہ پہ سے مناسب (3)
- قدرے مناسب (4)
- بالکل مناسب (5)

47 "گزشتہ 12 ماہ کے دوران، پھیپہڑوں ہی اسکریننگ کے بارے میں آپ سے ایک ذکر ہے یا مابینصحت نے پا رہے ہیں؟"

- نہیں (1)
- ہاں (2)

48 "انگریزی کی زبان پوائنٹ؟"

- انگریزی (1)
- خاندانی زبان (2)
اپنے طور پر آپنی شناخت کریں امریکی (1)
خاندانی نفس منظر (2)

کہیں (1)
ایک بار ایک سال یا اس سے کم (2)
ایک سال میں ایک بار (3)
ایک سال میں ایک بار (4)
بہتے میں ایک بار (5)
ایک سے زائد بار / بہتے (6)
<table>
<thead>
<tr>
<th>کتبی کہہ را یا کتبی نیں (1)</th>
<th>مبینے مہند بار (2)</th>
<th>1 مہینہ میں ایک بار (3)</th>
<th>نہیں (4)</th>
<th>2 یا زیادہ بار / بفٹ (5)</th>
<th>ایک ڈیلی میں ایک بار سے زیادہ (6)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>میری زندگی میں، مین اپ سے جدید ہو (1)</th>
<th>بے یقین مہند بار (2)</th>
<th>سچ ہو جاتا (3)</th>
<th>بے یقین گا شکار (4)</th>
<th>سچ بجتا (5)</th>
</tr>
</thead>
</table>
میرے مذہبی عقائد زندگی کے نقطہ نظر کا حصہ ہیں:

- یقینی طور پر سمجھنا ہوگا (1)
- سمجھا جانا ہے (2)
- یقینی کا شکار (3)
- سمجھا جانا ہے (4)
- میرے یقینی سمجھنا ہے (5)

میرے زندگی کے دیگر تمام معاملات میں اپنے دین پرچلنوں کی کوشش کرتا ہوں:

- یقینی طور پر سمجھنا ہوگا (1)
- سمجھنا جانا ہے (2)
- یقینی کا شکار (3)
- سمجھنا جانا ہے (4)
- میرے یقینی سمجھنا ہے (5)

End of Block: Block U9

Start of Block: Block U10

یہ سوالیں کا خری حسے ہیں۔ اگرچہ جن سوالات اپنی خصوصیات کے بارے میں پوچھنے گے۔ کوئی صحیح ہے یا غلط جوابات نہیں ہیں۔ اپنے علم کی بنیاد پر جواب دینے کیلئے۔
آپ مرد بین یا عورت؟

مرد (1)

خواتین (2)

آپ کی عمر کیا ہے؟

آپ کی نسل کیا ہے؟

امریکی بھارتی / ایشیائی (1)

ایشیائی (2)

سیاہ یا افريکی امریکی (3)

مقامی بونائی / دیگر پیسیفک جزیرہ (4)

وائیٹ (5)

ایک سے زیادہ ریس (6)

دیگر (7) واضحہ براہ مہربانی (:)

(7):
آپ اسپینی ، لاٹینی یا اسپانیو نسل کی بیں؟

(1) نہیں
(2) ہیں

آپ کس ملک میں رہتے بیں؟

(1) امریکہ
(2) دوسرا جگہ پر، وضاحت بھی لیں

آپ کس سٹیٹ میں رہتے بیں؟

(1) ایک غیر ملک میں
(2) زیادہ تر ایک غیر ملک میں
(3) زیادہ تر امریکہ میں
(4) امریکہ میں

آپ کی پرورش کہاں ہوئ؟

(1) ایک غیر ملک میں
(2) زیادہ تر ایک غیر ملک میں
(3) زیادہ تر امریکہ میں
(4) امریکہ میں
آپ ایک تارکین وطن ہیں ایک بچے/بنی کے بیٹھے کے بیٹے/بنی کے؟ تو آپ یا آپ کے خاندان کس ملک سے بیں؟

آپ کے تارکین وطن کی کس نسل سے بیٹھے ہیں؟

- بہت نسل (امریکہ سے بابر پیدا بونے والے) (1)
- دوسری نسل (امریکہ میں کم از کم ایک تارکین وطن و والدین کی پیدائش) (2)
- تیسری یا اعلی نسل (امریکی نژاد والدین کے ساتھ امریکی میں پیدا بچا) (3)
آپ کا موجودہ دین کیا ہے؟

اسلام (مسلم) (1)
پروٹسنت (2)
رومکیتھولک (3)
مورمن (4)
آرٹھوڈوکس (5)
بندو مت بندو (6)
پروتستان (7)
بندو مت بندہ (8)
کنفوشس (9)
تاو مت (10)
الحاد (11)
لامعافت (12)
خاص طور پر کچھ بھی نہیں (13)
جواب دینے کے لئے ترجیح نہیں (14)
کچھ اور (وضاحت کریں) (15)
آپ ایک مسلمان بیں، تو کس فرقے کی پیروی کریں؟ ایسی تمام ملاحظہ کریں (1)

( ) سنہت ابل سنہت
( ) شیعہ
( ) شیعہ شیعہ
( ) خاص طور پر کچھ بھی نہیں
( ) دیگر وضاحت پر موبانی

End of Block: Block U10

Start of Block: Block U11

کیا آپ نے کبھی مذہب تبدیل کیا ہے؟

( ) نہیں
( ) ہاں

End of Block: Block U11
آپ کی ازدواجی حیثیت کیا ہے؟

<table>
<thead>
<tr>
<th>نمبر</th>
<th>رجوعی عدد</th>
<th>ہمایع</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>شادی</td>
<td>☐</td>
</tr>
<tr>
<td>2</td>
<td>شادی کر کے رہنے والے</td>
<td>☐</td>
</tr>
<tr>
<td>3</td>
<td>طلاق</td>
<td>☐</td>
</tr>
<tr>
<td>4</td>
<td>بیوہ</td>
<td>☐</td>
</tr>
<tr>
<td>5</td>
<td>الگ کیا</td>
<td>☐</td>
</tr>
<tr>
<td>6</td>
<td>سنگل</td>
<td>☐</td>
</tr>
</tbody>
</table>
آپکی مکمل اسکول کی تعلیم کی سطح کیا ہے؟

(1) کونی بھی نہیں  
(2) 1st  
(3) 2nd  
(4) 3rd  
(5) 4th  
(6) 5th  
(7) 6th  
(8) 7th  
(9) 8th  
(10) 9th  
(11) 10th  
(12) 11th  
(13) 12th  
(14) GED  
(15) کچھ کالج / تکنیکی / تجارتی اسکول، لیکن کم 1 سال  
(16) کالج / تکنیکی / تجارتی اسکول میں سے ایک یا اس سے زیادہ سال، کونی ذگری  
(17) تکنیکی یا تجارتی ذگری یا سرٹیفیکیشن  
(18) ایسوسی ایٹ ذگری) مثال AA کے لئے  
(19) BSN، BS، AB، BA کے لئے  

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MBA، MSW، MPH، MS، MA) (20)

پیشہ ورائیٹ کی ذگری (مثال MD، DDS، PharmD، DVM) (21)

EDD (22)

(23) (پہلے بھری ہوئی ڈگری کے لئے)

وہ آپ کی موجودہ ملازمت کی حیثیت چاہتے ہیں؟

(1) کام بین

(2) بے روزگار

(3) گریجوائنٹ

(4) طالب علم

(5) ریٹائرڈ

(6) ایک معذوری کے ساتھ ایک فرد

(7) دیگر

(پھیلی ہوئی مہربانیی توضیح)

(268)
گزشتہ ایک سال کے لئے، تیکس سے پہلے آپ کے کل کے گھر کی امدی کیا تھی؟

○ کے درمیان 0 $ اور 9 $ ، (1) 999
○ کے درمیان 10 $ , 000 اور 14 $ , (2) 999
○ کے درمیان 15 $ , 000 اور (3) 19.999
○ کے درمیان 20 $ , 000 اور (4) 34.999
○ کے درمیان 35 $ , 000 اور (5) 49.999
○ کے درمیان 50 $ , 000 اور (6) 74.999
○ کے درمیان 75 $ , 000 اور (7) 999
○ کے درمیان 100 $ , 000 اور (8) 199.999
○ کے درمیان 200 $ , 000 اور سے زیادہ (9)

End of Block: Block U11

Start of Block: Block U12

آپ کی صحت کی انشورنس کسی بھی قسم کی بیے؟

○ نہیں (1)
○ جی یا (2)
کیا تم نے کبھی پھپھپوں کے کینسر کی تشخیص کرائی ہے؟

(1) نہیں
(2) جی ہاں

آپ کی موجودہ صحت کسی ہے؟

(1) خراب
(2) فیق
(3) اچھی
(4) بہت اچھی
(5) بہترین

آپ کے جوابات کو ریکارڈ کیا گیا ہے۔ اپ کی وقت کا شکریہ۔ ٹین 50 $ تخفیف، کارڈ منڈبیل مین حصل لینے کے لئے آپ کو فرائند مین منشن کر رہے ہیں بنی جبتنی ہمیشہ میں اپ سے رابطہ کیا جا رہا ہے؟ ایڈرس کی سپیک با دریافت میں اپنے آپ کے جوابات کو ای میل فری سے نہیں منسلک کیا جا رہا ہے۔