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Smoking Behavior in Arab Americans: Acculturation and Health Beliefs

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Smoking Behavior in Arab Americans: Acculturation and Health Beliefs

A dissertation submitted in partial fulfillment of the requirements for the degree of
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by

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Table of Contents

List of Tables

List of Figures

List of Appendices

SMOKING BEHAVIOR IN ARAB AMERICANS: ACCULTURATION AND HEALTH BELIEFS

By Roula Ghadban, Ph.D.

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Abstract

Background: Arab Americans, a growing population in the U.S., tend to have high rates of smoking and low rates of smoking cessation. Arab Americans and their families are at a high risk for poor health outcomes related to smoking.

Objective: The purpose of this study is to better understand the smoking behaviors of Arabs in the U.S., using the two publishable manuscripts format. The first manuscript is a systematic review of the literature exploring the smoking behavior, prevalence and use among Arab Americans and examining studies addressing the effect of acculturation on this behavior. The second manuscript is a cross-sectional quantitative study investigating factors influencing desire to quit smoking among Arab Americans, and their association with acculturation and health beliefs.

Results: The majority of the studies included in the first manuscript focused on smoking prevalence and cessation. Some discussed the impact of acculturation and health beliefs only two smoking cessation programs have been developed. Thus a cross-sectional descriptive study

among adult Arab American smokers was conducted to measure tobacco use, nicotine dependence, desire to quit smoking, acculturation, and health beliefs. The desire to quit smoking was positively associated with perceived severity and susceptibility to cancer, perceived benefits of quitting smoking; and negatively associated with smoking barriers and nicotine dependence. Being female, having lower level of nicotine dependence, and higher perception of cancer severity predicted higher desire to quit smoking.

Conclusion: Smoking cessation intervention studies need to target appropriate health beliefs, especially cancer severity of smoking among male Arab Americans.

Keywords: Minorities, Arab Americans, Acculturation, Health Beliefs, Smoking

Chapter I

Smoking Behavior in Arab Americans: Acculturation and Health Beliefs

Background

Smoking is one of the most addictive habits and most preventable causes for a broad range of diseases including cancer, cerebrovascular diseases, coronary heart disease, and chronic obstructive pulmonary disease (Bullen, 2008; Gandini et al., 2008; Gritz et al., 2006; Salim, Jazieh, & Moore, 2011; Twombly, 2005). The World Health Organization's (WHO) report on research for universal health coverage (2013) notes that smoking is responsible for about six million deaths annually worldwide; more than five million of these deaths occur in primary smokers, and the remainder die as a result of secondhand smoke exposure. While cancer is a leading cause of death both worldwide and in the United States (U.S.) (Siegel, Miller, & Jemal, 2015; Twombly, 2005), tobacco use is the most important known cause of cancer incidence and cancer-related death, accounting for an average of 30% of all cancer deaths in the U.S. (Jacobs et al., 2015; Gandini et al., 2008). There is sufficient evidence to infer causal relationships between smoking and increased risk for at least ten types of cancers, including lung, oral, laryngeal, stomach and acute myeloid leukemia (Bullen, 2008; Gritz et al., 2006; Salim et al., 2011). Higher rates of mortality have been reported for smoking-related cancers as compared to non-smoking-related cancers.

In the U.S., minority status is associated with increased smoking rates among adults (CDC, 2001; 2013; Forzley, 2005). Individuals belonging to ethnic minorities may choose to accept or reject health behaviors based on their cultural beliefs and such choices may be prime factors affecting their health. Consequently, there has been increased interest in the role of cultural variables, gender, and acculturation and their effect on smoking and cessation rates

among various ethnic groups (Bethel, & Schenker, 2005; Choi, Rankin, Stewart, & Oka, 2008; Gorman, Lariscy, & Kaushik, 2014).

Smoking prevalence in the U.S. differs noticeably between different ethnicities (CDC, 2006). Arab Americans, who comprise a growing population in the U.S., have high rates of smoking prevalence (39%-69%) as well as low smoking cessation rates (11.1%-22.2%) when compared with national data (U.S. average of 20%) (Haddad et al., 2012; Jamil, Templin, Fakhouri, Rice, Khouri, & Fakhouri, 2009; Rice, Templin, & Kulwicki, 2003; Rice & Kulwicki, 1992); largely because smoking is a standard cultural behavior, which they continue after immigration to the U.S. Unfortunately, due to the classification of Arabs as "White," there are no national data regarding the association of smoking with smoking-related diseases such as cancer, coronary artery disease, or respiratory diseases. One study examined death certificates in California from 1997 to 2004 for individuals who had country of birth, or country of birth of parents from the Middle East and found that first generation Middle Easterners had higher odds of diabetes, colorectal cancer, and heart disease when compared to non-Hispanic Whites. Men specifically had higher odds for all cancers and women had higher odds for breast cancer when compared to non-Hispanic Whites (Nasseri & Moulton, 2011). No information was provided with respect to smoking behaviors. To date, few studies have examined smoking in Arab Americans, a vulnerable minority population at risk for poor health outcomes in the long-term. Because each ethnic group experiences the immigration experience differently, examining the smoking behaviors of each minority group is essential prior to establishing successful interventions specific to the different ethnic minority groups (Jadalla & Lee, 2012). While more attention has been given to investigate different interventions to reduce cigarette smoking among

White Americans, less attention has been given to members of other ethnic groups living in the U.S.

Significance

The review of published empirical work examining smoking cessation among Arab Americans is very limited. A recent systematic review conducted by the principal investigator (PI) (under review), reported that few studies have examined smoking in Arab Americans. Of the studies that exist, the majority focused on smoking prevalence and smoking cessation, and some discussed the impact of acculturation and health beliefs on smoking behaviors in Arab Americans adolescents. To date, only two smoking cessation programs have been developed for Arab Americans, despite the high prevalence of both cigarette and water-pipe smoking in this community.

Health disparities exist in the U.S., particularly among ethnic minorities (Institute of Medicine, 2012). Studies provided evidence that risky health behaviors such as smoking and alcohol consumption are influenced by acculturation in these populations (Abraido-Lanza, Chao, & Florez, 2005; Choi, Rankin, Stewart, & Oka, 2008; Guthrie, Young, Williams, Boyd, & Kintner, 2002; Klonoff & Landrine, 1996; Zhang & Wang, 2008). Most of the studies on ethnic minorities found that acculturation may play a role in smoking among these populations and may account for the racial/ethnic differences in their smoking rates (Arcia, Skinner, Bailey, & Correa, 2001; Hunt et al., 2004; Klonoff & Landrine, 1999; Thomson & Hoffman-Goetz, 2009; Zhang & Wang, 2008). With the limited empirical knowledge available regarding the impact of acculturation and health beliefs on smoking behaviors and smoking cessation among Arab Americans, there is a significant need for research in this area to be able to design theory-driven and culturally-relevant smoking cessation interventions for Arab Americans.

Conceptual Framework

The influence of culture and acculturation on health behaviors and outcomes has been extensively studied among different minority ethnic populations such as Latin Americans and Asian Americans (Lim, Gonzalez, Wang-Letzkus, & Ashing-Giwa, 2009; Rodriguez-Reimann, Nicassio, Reimann, Gallegos, & Olmedo, 2004; Salant & Lauderdadle, 2003). A recent systematic review of the literature found that more acculturated Chinese men smoke less and more acculturated Chinese women smoke more (Gotay, Reid, Dawson, & Wang, 2015). Other studies have found similar trends (An, Cochran, Mays, & McCarthy, 2008; Zhang & Wang, 2008). Little is known about the association between acculturation and health behaviors, such as smoking cessation, in the Arab American population. Hence, two theoretical frameworks will be used to investigate the complexity of smoking behaviors and cessation among Arab Americans: the Health Belief Model (HBM) (Becker, 1974) and the Acculturation Model (Berry's Acculturation Model) (Berry, 1997, 2001).

The HBM, developed in the early 1950s, is one of the earliest theoretical models to describe or explain health-related behaviors. The HBM posits that one's action for seeking or maintaining health behaviors is influenced by individual perceived susceptibility to and severity of disease or illness, perceived benefits and barriers for preventive action, cues to action, and self-efficacy or perceived ability to perform the action in controlling the disease or illness (Becker, 1974; Lim et al., 2009).

The HBM guides the conceptualization of the changes taking place in a person's health behaviors. In this model, behavior of individuals is dependent on the values an individual places on a goal and on the individual's own perception that this goal will be achieved (Becker, 1974). HBM has five components: perceived susceptibility, perceived severity, perceived benefits,

perceived barriers, and self-efficacy. Perceived susceptibility assesses individual's subjective perception of getting a certain disease, in this study cancer; perceived severity looks into an individual's perception of the seriousness and severity of this disease, and its impact on the individual's life. Perceived benefits tap into the perception of an individual's recommended actions as an alternative measure to relieve this condition or disease (smoking cessation); perceived barriers looks at the individual's perceptions of effort, cost and any other negative behavior as a barrier in taking the recommended action (smoking cessation); and finally self-efficacy (feeling competent to stop smoking) (Becker, 1974). In other words, the HBM assumes that when an individual perceives a threat from a disease, in this study cancer, (measured by perceived susceptibility to cancer and perceived severity of cancer), and perceived benefits from preventive action, in this study smoking cessation, exceed barriers, then the individual is likely to take preventive action and to change his/her behavior (Deshpande, Basil, & Basil, 2009).

The HBM has been widely used worldwide in addressing multiple health-related behaviors (Arevian, Noureddine, & Abboud, 2009; Deshpande, et al., 2009; Karayurt & Dramal, 2007; Vassallo et al., 2009). However, the HBM does not consider the role of culture on health and health behaviors. Cultural factors can have a large influence on health behavior and acculturation may affect health behaviors as a consequence of coping responses to several immigration experiences such as changes in identity, beliefs, values, or norms, loss of social networks, exposure to different models of health behaviors, and discrimination and poverty (Abraido-Lanza, Armbrister, Flórez, & Aguirre, 2006). For these reasons, cultural considerations will be added to better understand the association between acculturation among Arab Americans and health behaviors such as smoking cessation.

When different cultures come into contact, such as an immigrating family with the host country, the process of acculturation takes place. Acculturation is the complex and continuous process of interaction between these cultures that result in cultural and psychological changes (Berry, 2005). Culture plays a major role in person's ideas about illness, disease, and health (Jadalla & Lee, 2012). Acculturation may be challenging and stressful and it is well known that many people use smoking as a coping mechanism when they feel stress (Klonoff & Landrine, 1999). Acculturation is potentially a major factor influencing low rates of quitting among ethnic groups. Acculturation has been linked to health behaviors and health outcome among immigrants (Byrd, Peterson, Chavez, & Heckert, 2004; Lim et al., 2009; Rodriguez-Reimann et al., 2004).

Berry's Acculturation Model suggests that the relationship between the traditional culture and the host or dominant culture plays a significant role in the acculturation process and accordingly in many other daily related decisions such as health decisions. According to Berry, in order to understand immigration transition, it is necessary to uncover the personal, community, and societal conditions that facilitate or hinder progress toward achieving a healthy transition (Berry, 2001). Berry (1997, 2001) also uncovered the different contextual, environmental and individual factors that are believed to influence acculturation in different persons. Some factors affecting acculturation for Arab Americans were consistent across the reviewed literature, one of which was generational level (Taylor, Welch, Kim, & Sherman, 2007). Individual characteristics attribute meanings to their transitions and adaptation, and these meanings might facilitate or hinder healthy transition and acculturation (Berry, 2001; Im, 2009; Meleis, 2010). Similarly, socio economic status might serve as an inhibitor or facilitator of an optimal transition (Meleis, 2010).

Berry (1997, 2001, 2005) described four acculturation strategies: marginalization, separation, assimilation and integration. Marginalization occurs when the individual gives up his original culture and faces rejection from the new culture, as a result the acculturating individual no longer identifies with any of the two cultures (major and minor cultures). Separation refers to the situation when the individual resists the change and refuses to adapt with the new culture while retaining the old ethnic identification. Assimilation denotes the situation when the immigrant loses his/her original cultural identity as a result of acquiring the identity of the new culture. Integration discusses the level of acculturation when the individual develops a bicultural position with a successful identification and integration with the old and new culture.

The integration of these two frameworks (Figure 1) give value to individuals' experiences with immigration and acculturation while taking into consideration the complexity of the whole process; in addition the HBM is based on the subjective beliefs and perceptions of health and illness of the population being studied.

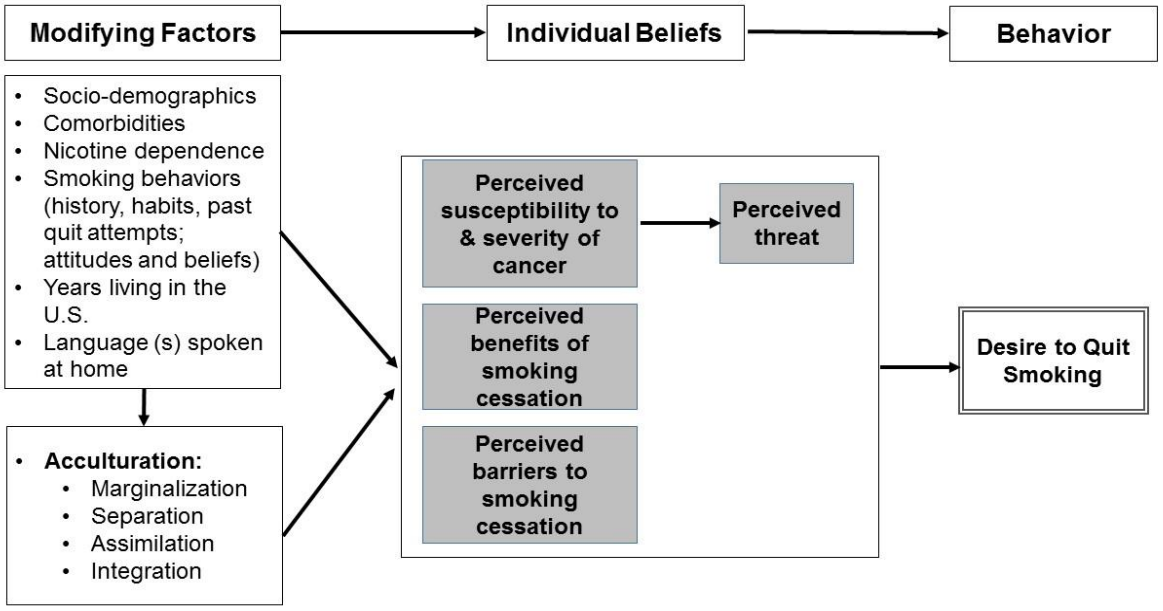

Figure 1. Conceptual Framework

Specific Aims and Hypotheses

The overall purpose of this study is to investigate smoking behaviors, specifically desire to quit smoking, among Arab Americans and their association with acculturation and health beliefs. The specific aims are:

1. to account for the variation in desire to quit smoking behavior among Arab Americans as explained by acculturation level, gender, perceived susceptibility to and perceived severity of cancer, and perceived barriers and perceived benefits of smoking cessation.
2. to characterize gender differences in smoking behaviors; acculturation, perceived susceptibility to and perceived severity of cancer, and perceived barriers and perceived benefits of smoking cessation among Arab Americans.

The following hypotheses will be tested:

a. Arab Americans' acculturation level, perceived susceptibility to and perceived severity of cancer, and perceived benefits of smoking cessation are positively associated with desire to quit smoking.
b. Arab Americans' perceived barriers of smoking cessation are negatively associated with desire to quit smoking.
c. Male Arab Americans have lower acculturation levels, lower perceived susceptibility to and perceived severity of cancer, lower perceived benefits of smoking cessation, lower desire to quit smoking, and higher perceived barriers to smoking cessation than female Arab Americans.
d. Acculturation and individual beliefs uniquely contribute to smoking behaviors after controlling for gender.

Methods

Design

The selected design, a cross-sectional method, is optimal for this study because of its main focus on assessing and describing acculturation and health beliefs and their effects on smoking behaviors in Arab Americans adults. In addition, it is practical, feasible, and economical, and since data are collected once, there is no loss of participants or attrition. Data will be collected at one point in time, with eligible participants completing questionnaires addressing acculturation, smoking history and nicotine dependence, and health beliefs and behaviors related to smoking.

Sample, Setting and Procedures

Sampling Method: A non-probability purposive sampling method will be used in this study to ensure using all potentially available individuals in order to obtain as representative a sample as possible (Hulley et al., 2013). Upon obtaining Institutional Review Board (IRB) approval from Virginia Commonwealth University for the study and approvals from the recruiting clinics and centers, the process of recruitment was initiated. Inclusion criteria were individuals who are: smokers, age of 18 or older, identify themselves as first, second or third generation Arab or Arab Americans, able to read and write English, and willing to participate in the study. Exclusion criteria were Arab Americans who are former or non-smokers and who moved to the U.S. in less than three months since these participants may have different immigration and acculturation experiences.

Sample Size: The minimum required sample size for this study using estimates based on previous research (example Al-Omari & Scheibmeir, 2009) and multiple regression analysis was 83, given the desired probability level of 0.05, the number of independent variables in the model

(six independent variables: gender, acculturation level, perceived susceptibility to and perceived severity of cancer, and perceived barriers and perceived benefits of smoking), the anticipated medium effect size of 0.15 (R^2), and the desired statistical power level of 0.80 (Polit, & Beck, 2012, p.442). The targeted sample size was 96 to take into account the possibility if missing data in 15% of the collected surveys.

Setting and Recruitment: Multiple outreach settings were used to recruit the needed sample for the study in Buffalo, New York. Physicians' private clinics in Buffalo, Buffalo Cancer Center, faith-based organizations, and Middle Eastern grocery stores, restaurants, lounges were selected as data collection sites in Buffalo. Fliers (Appendix A) were distributed at these sites. Buffalo has a large population of Arab Americans especially of Lebanese, Syrian, Egyptian, and Iraqi origins. The PI had access to this population through personal and organizational networking.

Data Collection Procedure

Individuals who show interest in participation, were screened either over the phone or face-to-face by the PI for inclusion criteria using a screening protocol (Appendix B). The participants chose to either have the questionnaire delivered to them by mail (with a return envelope and the informed consent) or to complete the questionnaire through a meeting with the PI. For those who chose to meet in person, the PI scheduled a convenient time and place for the completion of the questionnaire. Possible meeting places were private rooms in clinics or faith-based organizations' conference rooms; the PI obtained prior approval from the clinics and religious leaders for the use of the conference rooms. On the scheduled date, the PI provided further explanation about the study, including assurance of anonymity and confidentiality and the participant signed an informed consent (Appendix C). The PI was present to answer any

questions that the participant had. The questionnaires (Appendix D) took approximately 30 minutes to be completed.

Variables and Measures

Key variables required to achieve the specific aims include: smoking behaviors including desire to quit smoking, acculturation, and health beliefs. All tools have been previously used and tested for psychometric properties in different populations including Arabs. Table 1 provides a list of all the variables with their conceptual and operational definitions.

Modifying Variables:

Socio-demographics. Age, gender, country of origin, years living in the U.S., marital status, language(s) spoken, level of education, annual income, employment, comorbidities (including cancer history for participant and family), and smoking behaviors.

Smoking behaviors. (Smoking history, smoking habits, past quit attempts, and attitudes and beliefs toward tobacco use) are measured using the Tobacco Use Questionnaire (TUQ) (Rice, Templin, & Kelwicki, 2003), The TUQ is a self-report questionnaire that contains 31 questions about smoking history, smoking habits, past quit attempts, attitudes and beliefs toward tobacco use, and desire to quit. TUQ has shown high validity, high test–retest reliability (r=0.89) and high internal consistency (Cronbach's α=0.86) as reported by its developers (Rice et al., 2003).

Nicotine Dependence. Fagerström Test for Nicotine Dependence (FTND), which is a 6-items scale used to measure the level of nicotine dependency or addiction. It assesses how soon tobacco use begins each day, which cigarettes during the day a person could do without, how smokers cope in places where they cannot smoke, and how frequently and how deeply they smoke. FTND has good test–retest reliability, convergent validity, and discriminant validity, the test–retest reliability coefficient values ranged from 0.65 to 0.72 (Rice et al., 2003).

Independent Variables:

Acculturation. The Acculturation Rating Scale for Arab Americans - II (ARSAA-II) will be used to measure separation/assimilation and integration/marginalization. These scales have internal reliability coefficients (Cronbach alphas) of 0.71 and 0.73, respectively (Barry, 2005). The ARSAA-II tool (8 items) assesses the participants' language use and preference, ethnic identity, cultural heritage and ethnic behavior, and ethnic interaction (between the American and Arabic cultures). Then according to the scores, participants will be placed in one of Berry's four modes of acculturation (assimilation, integration, separation and marginalization) (Cuellar et al., 1995). Items are scored on a 7-point Likert-scale from strongly agree to strongly disagree. Scale scores are derived by summing reverse-scored and positive-scored scale items.

Health Beliefs. We will measure the different constructs of the HBM: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers using scales that have been previously used and investigator developed items. The perceived barriers (El-Shahawy & Haddad, 2015) scale is one of the most important scales in this study because it is concerned with the individual's perception of the difficulty and costs of advised actions to reduce health threats, such as chronic conditions due to certain health behavior (Becker, 1974).

Outcome Variable:

Desire to quit smoking. This variable will be measured using a single item from the TUQ that asks participants their desire to quit smoking on a scale of 1 to 10 (higher scores mean stronger desire to quit smoking).

Table 1. Conceptual and Operational Definition of the Variables

Variables	Definition	Measure/Item	Psychometric Properties
Outcome Variable			
1. Desire to quit smoking	Participants' self-report of their desire to quit smoking.	One item from the Tobacco Use Questionnaire (TUQ): How much do you want to quit smoking on a scale of 1 to 10? (from not at all to very much).	
Independent Variables			
1. Acculturation	Social interaction and communication styles that individuals adopt when interacting with individuals and groups from another culture.	*Arab Acculturation Scale* (2 subscales; 8 items): separation/assimilation and integration/marginalization. Items are scored on a 7-point Likert-scale from SA to SD. Scale scores are derived by summing reverse-scored and positive-scored scale items.	The separation/assimilation and integration/marginalization scales had internal reliability coefficients (Cronbach alphas) of 0.71 and 0.73, respectively (Barry, 2005).
2. Gender	Participants' gender self-identification.	1. Male 2. Female	
3. Perceived Susceptibility	Beliefs about the harms of smoking and the likelihood of getting cancer.	Seven items measured on a 5-likert scale; higher mean scores reflect higher perceived susceptibility.	Questions adopted from a study conducted in Jordan using the Health belief Model in explaining attitudes and beliefs toward exercise and myocardial infarction (Al-Ali & Haddad, 2004). Cronbach's alpha for the perceived susceptibility subscale was 0.51.

Variables	Definition	Measure/Item	Psychometric Properties
			"Myocardial infarction/heart disease" was replaced by cancer.
4. Perceived Severity	Beliefs about the seriousness of getting cancer, including consequences.	Nine items measured on a 5-likert scale; higher mean scores reflect higher perceived severity.	Questions adopted from a study conducted in Jordan using the Health Belief Model in explaining attitudes and beliefs toward exercise and myocardial infarction (Al-Ali & Haddad, 2004). Cronbach's alpha for the perceived severity of exercise subscale was 0.71. "Myocardial infarction/heart disease" was replaced by cancer.
5. Perceived Benefits	Beliefs about the positive aspects of quitting smoking and its effectiveness.	13 items measured on a 5-likert scale; higher mean scores reflect higher perceived benefits.	Questions adopted from a study conducted in Jordan using the Health Belief Model in explaining attitudes and beliefs toward exercise and myocardial infarction (Al-Ali & Haddad, 2004). Cronbach's alpha for the perceived benefits of exercise subscale was 0.73. "Exercise" was replaced by smoking cessation.
6. Perceived Barriers	Beliefs about the obstacles and the negative aspects to quitting smoking.	Barriers to Cessation questionnaire: This scale consists of 19 items and contains three subscales in addition to the "gaining weight" item: 1. Addiction Barriers subscale (eight items) 2. External Barriers subscale (seven	Developed by Macnee & Talsma (1995) and previously used among Arab Americans by El-Shahawy & Haddad (2015). Cronbach's alpha coefficient for addictive barriers 0.84; for external barriers 0.80; and for

Variables	Definition	Measure/Item	Psychometric Properties
		items) 3. Internal Barriers subscale (three items) The score for this scale ranges from 0 to 95. Higher score reflect more barriers.	internal barriers 0.71. The three subscales were moderately related with Pearson's coefficients ranging from 0.33 to 0.41.
Socio-Demographic Variables and Other Modifying Variables			
1. Age	The age of the participants.	How old are you?	
2. Relationship Status	Participants' relationship status.	What is your current marital status? 1. Single 2. Married 3. Living with a partner 4. Separated 5. Divorced 6. Widowed	
3. Country of Birth	Where the participants were born?	Were you born: 1. In the USA 2. Outside the USA, please specify:	
4. Years Living in the USA	How many years have the participants lived in the USA?	If born outside of the USA, for how many years have you been living in the USA?	
5. Ethnicity		Ethnicity (check all that apply) 1. Arab 2. Arab American 3. Other (please specify):	
6. Language Spoken at Home	The dominant language spoken at home.	What language is spoken at home? 1. Only Arabic	

Variables	Definition	Measure/Item	Psychometric Properties
		2. Mostly Arabic 3. Arabic and English both equally 4. Mostly English 5. Only English 6. Other (please specify):	
7. Education	Highest educational degree earned.	What is your highest educational degree? 1. Middle School 2. High school graduate 3. Some college or 2-year degree 4. 4-year college graduate 5. More than 4-year college degree 6. Refused	
8. Employment	Employment of participants.	Are you currently? 1. Working full time for pay 2. Working part time for pay 3. Unemployed and looking for work 4. Temporarily laid off or on leave 5. Disabled/Unable to work 6. Retired 7. Student 8. Others (please specify):	
9. Income	The yearly income of participants.	What is your yearly income? 1. Less than $25,000 2. $25,000-$50,000 3. $50,000-$75,000 4. $75,000-$100,000 5. More than $100,000	
10. Medical Family History	Participants' self-report of family medical problems.	Do you have a family history of 1. Hypertension	

Variables	Definition	Measure/Item	Psychometric Properties
		2. Diabetes 3. Cardiac Problems 4. Cancer 5. Others (please specify):	
11. Comorbidities	Participants' self-report of other medical problems.	Have you been diagnosed with any of the following: 1. Hypertension 2. Diabetes 3. Cardiac Problems 4. Cancer 5. Others (please specify):	
12. Smoking Behaviors	Participants' self-report of smoking history, smoking habits, past quit attempts, and attitudes and beliefs toward tobacco use.	Tobacco Use Questionnaire (TUQ) (31 items).	TUQ has shown high validity, high test–retest reliability (0.89) and high internal consistency (0.86) as reported by its developers (Rice et al., 2003).
13. Nicotine Dependence	Assessment of how soon tobacco use begins each day, which cigarettes during the day a person could do without, how smokers cope in places where they cannot smoke, and how frequently and how deeply they smoke.	Fagerström Test for Nicotine Dependence (FTND), which is a 6-items scale used to measure the level of nicotine dependency or addiction.	FTND has good test–retest reliability, convergent validity, and discriminant validity, the test–retest reliability coefficient values ranged from 0.65 to 0.72 (Rice et al., 2003).

Data Management and Analysis

Data were de-identified, cleaned, and double-entered into an SPSS dataset that was used for all the analyses, and stored on a secure research server. It is uncommon to obtain a full set of data however SPSS gives different options of how to deal with missing data such as the exclude case listwise option (totally excluding the case if one piece of information is missing), exclude case pairwise option (excluding the case if the piece of information missing is required for the particular analysis) or the replace with mean option (calculating the mean for the variable and replacing any missing data with it) (Pallant, 2007).

In addition to descriptive statistics, ANOVA and t-test were used to examine gender differences between and within the Arab American's health beliefs regarding acculturation, perceived susceptibility to and perceived severity of cancer, perceived barriers and perceived benefits of smoking cessation, and desire to quit smoking.

Multiple regression analysis was conducted to predict the relationship between desire to quit smoking and the predictor variables (gender, acculturation level, perceived susceptibility to and perceived severity of cancer, perceived barriers and perceived benefits of smoking cessation). All predictor variables were entered into the regression equation at the same time; this strategy is most appropriate when predictors are of comparable importance to the research question (Polit & Beck, 2012).

Human Subject Protection

Institutional Review Board approval was sought from Virginia Commonwealth University before the initiation of the study. The participants signed an informed consent informing them of the purpose of the study. Participants were assured of confidentiality and anonymity, and were provided with contact information of the PI.

All identifiable paper copies of consent forms, demographic data, and paper-and-pencil questionnaires were kept in a locked cabinet. In addition, all study documents (list of participant identification) were maintained on a secure server and a password-protected and encrypted drive. Survey data was treated confidentially with no identifying information shared or presented in any report. Data were not be shared with or accessed by third parties.

Limitations

Because we used self-reported data, social desirability bias can be a limitation. Social desirability bias occurs when participants taking a survey tend to answer the questions in a way that is viewed favorably by others, either by reporting "good behavior" or not reporting "undesirable behavior." Certain limitations can be related to sample size; thus, the researcher will make greater effort to recruit more than the sufficient sample size to control for missing data. Through the use of non-probability purposive samples, participants more readily accessible to the researcher are more likely to be included. Thus, opportunity to participate is not equal for all individuals in the target population and study results are not necessarily generalizable to this population. Other limitations can be attributed to the cross-sectional nature of the design thus limiting inference to associations.

Chapter II

Review of Literature

Smoking Behavior in Arab Americans: A Systematic Review

Abstract

Background: In the United States (US), Arab Americans who maintain traditional cultural norms after their immigration are more likely to continue smoking as a form of social interaction. Arab Americans and their families are at a high risk for poor health outcomes related to smoking.

Objective: This systematic review aimed to explore the smoking behavior, prevalence and use among Arab Americans and examine studies addressing the effect of acculturation on this behavior.

Results: The majority of the studies included focused on smoking prevalence and cessation. Some discussed the impact of acculturation and health beliefs on the smoking behavior of Arab American adolescents. Only two smoking cessation programs have been developed for Arab Americans, despite the high prevalence of both cigarette and water-pipe smoking in this community.

Conclusion: The scarcity of research on smoking among Arab Americans has impeded the development of interventions that improve health outcomes and reduce health disparities.

Keywords: Minorities, Arab Americans, Acculturation, Health Beliefs, Smoking

Introduction

Smoking is one of the most addictive habits and most preventable causes for a broad range of diseases including cancer, cerebrovascular diseases, coronary heart disease, and chronic obstructive pulmonary disease.[1-5] There is sufficient evidence to infer causal relationships between smoking and increased risk for at least ten types of cancers.[1,3,4]The World Health Organization's (WHO)[6] report on research for universal health coverage notes that smoking is responsible for about six million deaths annually worldwide; more than five million of these deaths occur in primary smokers, and the remainder die as a result of secondhand smoke exposure. Despite the well-established harmful health effects of smoking, and the enormous efforts to reduce the prevalence of smoking, 20.5% of men and 15.3% of women in the US are currently smokers.[7]

In the United States (US), minority status is associated with increased smoking rates among adults.[7-9] Individuals belonging to ethnic minorities may choose to accept or reject health behaviors based on their cultural beliefs, and such choices may be prime factors in their health. Consequently, there has been an increased interest in the role of cultural variables and their effect on smoking and cessation rates among various ethnic groups. In fact, according to the CDC,[7] American Indians/Alaska Natives have the highest prevalence of smoking (31.4%), followed by African Americans (20.6%), Whites (21.0%), Hispanics (12.5%), and Asians (9.2%). Research shows that racial and ethnic status contributes to health disparities among minorities in the US.[9] Arab Americans, who comprise a growing population in the US, have high rates of smoking prevalence (39%-69%) as well as low smoking cessation rates (11.1%-22.2%) when compared with national data,[10-12] largely because smoking is a standard cultural behavior that Arab Americans continue after immigrating to the US. However, to date, and due to the classification

of Arabs as "White," there are no national data on Arab American smoking prevalence rates and only a few studies have examined smoking in Arab Americans, a vulnerable minority population at risk for poor health outcomes.

Acculturation is the complex and continuous process of interaction between two cultures that results in cultural and psychological changes.[13-16] This interaction and its consequences on families, education, and health have been the primary focus of many sociological, psychological, and anthropological studies.[16-18] Culture plays a major role in a person's ideas about illness, disease, and health.[19,20] Immigration and acculturation are essential parts of US history. The US has drawn people from all over the world for countless reasons; as a result, America is rich in both multinational and multicultural diversity. In the 1880s an influx of European immigrants began, a trend that has continued up to the present and expanded to an even wider variety of immigrants, including Arabs. In fact, according to the Arab American Institute (AAI),[21,22] at least 3.5 million Americans are of Arab descent. The term Arab American is an overarching identity for many Arabs living in the USA. Although the term is simply defined as "the immigrants to North America from Arabic-speaking countries of the Middle East and their descendants"[22] there is a controversy regarding whether speaking Arabic is enough for a person to identify as an Arab. Many of the second, third, or fourth generations do not speak Arabic but still identify as Arab. The majority of Arab Americans have ancestral ties to Lebanon (34%), Syria (11%), Egypt (11%), Palestine (6%), and Iraq (3%).[22] Arab Americans are found in every state, but more than two thirds of them live in just ten states (California, Michigan, New York, Florida, Texas, New Jersey, Illinois, Ohio, Pennsylvania and Virginia). One-third of the Arab-American population resides in metropolitan Los Angeles, Detroit, and New York.[21]

Demographic information on Arab Americans is virtually nonexistent since the US government does not recognize them as a minority group[23] and classifies them as "White." Because of this classification, Arab Americans continue to be culturally invisible.[24] Arab Americans tend to be young and well educated: more than 30% of the population is under 18 years of age;[22] 89% have at least a high school diploma and 45% have a bachelor degree.[21] About 60% of Arab American adults are in the labor force; 5% are unemployed and the median income for Arab American households in 2008 was $56,331 with 13.7% of the population living below the poverty line.[21] Recently, however, a few studies have been conducted among Arab-Americans and, more specifically, developed in relation to Arab-American history,[22] identity,[24,25] the impact of September 11, 2001,[26] feminism and sexuality,[27,28] acculturation,[25] and health.[19]

Individuals from different cultures experience unique trajectories of acculturation. Furthermore, studies have provided evidence that risky health behaviors such as smoking and alcohol consumption are influenced by acculturation in these populations.[29-34] Most of the studies on these minorities found that acculturation may play a role in smoking among these populations and may account for this racial difference in their smoking rates.[34-38] It is well known that health disparities exist in the US, particularly among ethnic minorities.[29] Thus, in recent years, there has been a proliferation of research on human behaviors and practice based on minorities along with an emphasis from the National Institutes of Health (NIH) to have more minorities included in research.[39] In current health research, however, most acculturation studies are generally conducted with Hispanic or African American minorities.[36] The purpose of this systematic review, therefore, was to examine current literature about smoking behavior, prevalence and use among Arab Americans; in order to help outline directions for future research in this understudied area of inquiry.

Methods

Protocol Development

We developed the review protocol by stating all aspects of the review methods before starting the review. These included the following: inclusion criteria for studies, search strategy, screening method, abstraction, quality assessment, and data analysis. This aspect of the design was planned to minimize the effect of our possible bias on the review.

Eligibility Criteria

Our inclusion criteria included: all kind of study designs (randomized controlled trials, non-randomized trials, observational studies, and qualitative studies) published in English. Studies did not need a minimum sample size to be included. Population: Arab individuals, Arab American groups, or Arab American communities. We Excluded studies reported as abstracts and for which we could not identify a full text after contacting the corresponding author. Additionally articles were excluded if they were conducted outside of the US or if they were literature reviews.

Search Strategy

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Guidelines[40] was used to conduct this literature search and review on Arab Americans and smoking. This systematic review evaluates research examining smoking behavior in Arab Americans. The review includes all studies that were published in English between January 1, 1990, and June 30 2016. A systematic literature search was identified through the following databases: PubMed, CINAHL, Embase, ScienceDirect, and Cochrane Library. Ancestry searches were used to identify any relevant studies that were not detected by the primary search. Because water-pipe smoking is a highly-prevalent behavior among Arabs and Arab Americans (practiced

by an estimated 17% to 44.2% of this population),[10,41,42] studies that included water-pipe smoking or exclusively looked at water-pipe smoking behaviors among Arab Americans were also included. In addition, studies that included both adolescents and adults were included in this review. Studies were excluded if they were conducted outside of the US or if they were literature reviews.

The search terms included combinations of the following: "minorities," [All fields] "Arab Americans," [All fields] "acculturation," [All fields] "health beliefs," [Tittle/abstract] "smoking," [All fields] "water-pipe," [Tittle/abstract] "hookah," [Tittle/abstract] "shisha,"[Tittle/abstract]" and "smoking cessation" [Tittle/abstract].

Data Abstraction

The data abstraction form was piloted over 5 studies and used to abstract general information about the paper, where the study was conducted, study characteristics, populations studied, design features that affected the quality of the study and the validity of the results, outcome measures, and quality assessment data. Abstraction was performed in duplicate independently. Any disagreement was resolved by discussion.

Data Analysis

Two reviewers extracted data from the papers; the reviewers worked independently on each paper and then amalgamated the results. Discrepancies were resolved by referral back to the original papers and discussion. We did not combine the results of the studies because of the heterogeneity of design, outcomes, and populations. In our narrative analysis we consider the results in relation to the design and quality of the studies.

A total of 2105 studies were identified from databases and ancestry searches; 994 were excluded because of duplication, no-applicable titles and abstract review, resulting in 1111

studies on different minorities in the US: Hispanics/Latinos (n=527), African Americans (n=317), Asians (n=213), and Arab Americans (n=54) (Figure 1).

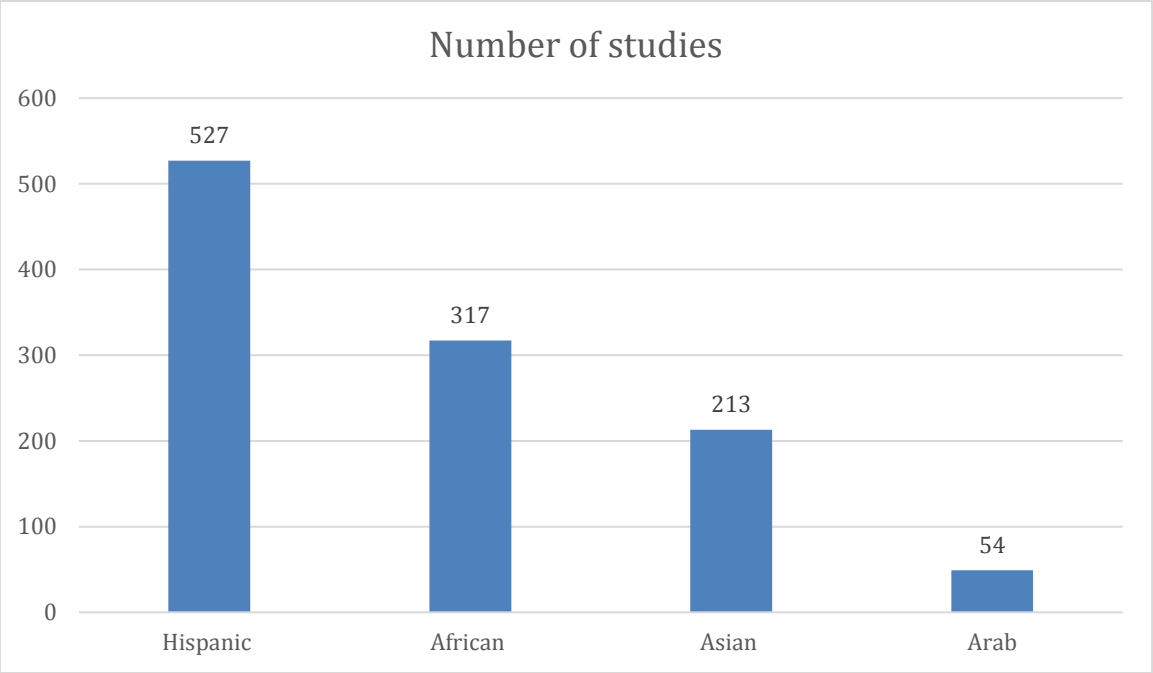

Figure 1: Search Results on Smoking in Minorities in the US

Results

For this systematic review, the 54 studies identified as relevant to Arab Americans were screened. 31 were excluded because they were conducted outside of the US and another two were excluded because they were literature reviews. Five other articles were identified from the ancestry searches and were included, resulting in a total of 26 studies meeting the inclusion criteria.

Study Characteristics

Nineteen articles were cross-sectional studies investigating the different relationships between smoking behavior, smoking cessation, health beliefs, and acculturation, and 7 articles described two smoking cessation interventions (one in adults and one in adolescents) (Table 1).

One study used a qualitative descriptive design with focus groups, and 25 studies used different quantitative designs. As for location, one study was conducted in California, one study was conducted in Colorado, two studies were conducted in Texas, 6 studies were conducted in Virginia, and 16 were conducted in the Midwestern region, near Michigan. All studies used convenience sampling and recruited participants from schools and/or faith-based centers (Islamic centers and mosques), Middle Eastern grocery shops, water-pipe bars, and/or health centers depending on the age of the targeted population and Internet. The sample size ranged from 8 participants (pilot intervention) to 3543 participants. In addition, 12 studies were conducted with Arab American adolescents and 14 were conducted with Arab American adults.

Table 1: Summary of Studies on Smoking Behavior in Arab Americans, N=26

STUDY (Refer to References List for complete citation)	STUDY DESIGN	SAMPLE SIZE & CHARACTERISTICS	STUDY PURPOSE/ AIMS	FINDINGS	COMMENTS/ LIMITATIONS
1. Al-Faouri et al., 2005	Instructional design	Arab Americans Health educators and students Group of students who were new immigrants	1. To redesign Project Toward No Tobacco Use (TNT) to be culturally sensitive for Arab American youth. 2. To add health promotion and tobacco use prevention elements. 3. To develop an Arabic version of the revised program. 4. To develop a program guide for health educators on the instructional resources used in this project.	Both the English and Arabic versions of the program were revised and evaluated during instructional development and application to make the necessary changes. A culturally sensitive multimedia Power-Point Arab-American Tobacco Use–Intervention Program (AATU-I) in English and in Arabic has been developed.	Implementation and evaluation of its effectiveness is ongoing.
2. Al-Omari & Scheibmeir, 2009	Cross-sectional exploratory correlational design	Arab American smokers and ex-smokers N= 96 participants	To describe Arab Americans' smoking behaviors and any relationship between tobacco dependence and acculturation.	Arab Americans who are less acculturated to American norms view tobacco smoking as an acceptable behavior. The results support the	The sample was nonrandomized and there was an overrepresentation of men in the sample.

				body of literature that identifies a relationship between continued smoking behavior and living in a residence where smoking is tolerated.	
3. Alzyoud et al., 2014	Pilot study Cross-sectional correlational design	Self-identified Arab American Immigrants N= 221 Convenience sample	1. To explore the possible patterns of Arab American waterpipe users, including current use, previous use, and intentions to quit. 2. To explore the relationship between acculturation and waterpipe smoking among Arab immigrants in the Richmond, VA metropolitan area.	Higher rates of waterpipe use were found among males than females (66% versus 31.4%) No significant association between the type of tobacco used (exclusive versus dual) and desire or future intentions to quit waterpipe use. None of the proxy indicators of acculturation was significant for the entire sample. However, upon stratifying the results by group (exclusive vs. dual), exclusive waterpipe use was significantly correlated with proportion of life lived in the US (r(16)=0.56, p=0.02) as	Further studies are needed to confirm the relatively high prevalence of waterpipe use among Arab Americans. There is a need to develop effective prevention strategies that will consider the acculturation process when trying to control the spread of waterpipe use among minority groups in the U.S. The limitations of this study include the use of a non-random sample. The acculturation association was assessed using a rough proxy measure instead of a

				but the correlation remained not significant among dual smokers (r(23)=0.08, p=0.6).	psychometric tool. Finally, the measure of tobacco use was based on self-report only.
4. Athamneh et al., 2015	Observational cross-sectional study	Arab American adults N=340 Convenience sample	1. To address waterpipe smoking in this ethnic minority. 2. To plan to control the growing epidemic in the general U.S. population.	The prevalence of having an intention to quit waterpipe smoking among this study sample was 27.43%. The intention to quit waterpipe smoking in this study sample was significantly lower with increasing age. Intention to quit waterpipe smoking was significantly higher with history of cigar use, a prior attempt to quit, and not smoking when seriously ill. Intention to quit waterpipe smoking was significantly lower with increasing age, medium cultural acceptability of using waterpipe among family, high cultural acceptability of using waterpipe among friends,	Inability to draw causal associations with such a design. The study was conducted using a convenience sample, thus the generalizability of the finding may be limited to the geographic area of the sample and not to all Arab Americans. The results relied on subject's self-reported data, which might contain some potential sources of bias.

				longer duration of smoking sessions, and perceiving waterpipe smoking as less harmful than cigarettes.	
5. Athamneh et al., 2016	Observational cross-sectional study	Arab American adults N=340 Convenience sample	To examine the theory of planned behavior (TPB's) constructs' effect on intention to quit water pipe smoking in the following 12 months among a sample of Arab Americans in the Houston area.	Behavioral evaluation, normative beliefs, and motivation to comply were significant predictors of an intention to quit water pipe smoking adjusting for age, gender, income, marital status, and education.	Efforts are greatly needed to design interventions and strategies that include these constructs in order to help water pipe smokers quit and to prevent the potentially associated morbidity and mortality.
6. Baker, 2005	Descriptive correlational design	Arab Americans: Yemeni-American adolescents Males and females N= 297 Convenient sample	To identify and describe relationships between selected predictors and tobacco use behavior in Yemeni-American adolescents by examining the personal and environmental factors of parental and peer tobacco use and the psychological factors of self-esteem and experimentation of tobacco use.	Educational performance and family income has significantly positive effects on self-esteem, and peer influence has a significantly indirect effect on tobacco use. Age, parental smoking, and experimentation with tobacco have significantly positive effects on tobacco use. Educational performance has a significantly negative effect on it.	The findings have implications for nursing and medical practice in the assessment and planning of culturally sensitive interventions to prevent tobacco use in Yemeni-American adolescents. Health professionals need to be aware of similarities and differences with the dominant culture when they are interacting with minority populations.
7. Baker & Rice,	Descriptive	American Arab Yemeni	1.To explore the	1. Adolescents' use of	To curtail and contain

2008	correlational design	adolescents Males and females N= 297 Convenience sample	relationships between the personal and environmental forces of parental and peer tobacco use and health risk action of tobacco experimentation and the psychological factor of self-esteem on waterpipe smoking. 2.To examine a cultural form of tobacco use (narghile/waterpipe smoking) and its relationship to self-esteem and to peer and family use.	narghile was associated with experimentation with tobacco. 2. The self-esteem variable did not contribute to predicting adolescents' narghile use. 3. Age and peer smoking had an indirect effect on narghile use. 4. The use of narghile was unrelated to parental tobacco use in any form despite the strong family ties in this population.	such health-risk behavior, it is apparent that serious culturally specific intervention sessions, health education, and preventive measures should be implemented and applied effectively. To foster and benefit from such culturally specific interventions, the tobacco control community must work to correct the current misperceptions about the health risks of water-pipe smoking.
8. El Hajj et al., 2015	Cross-sectional, descriptive, and correlational study	Adult Arab Immigrants N= 100 Non-probable sample	1. To examine tobacco use among Arab immigrants living in Colorado, whose socioeconomic status and health habits may be different from Arab immigrants living in other states. 2. To understand the effect of acculturation on tobacco use, both cigarettes and	1. Participants who were more integrated into Arab culture were more likely to use tobacco products and to have family members and friends who use tobacco products. 2. Acculturation plays a major role in affecting the health habits of Arab immigrants living in Colorado, especially in	The limitations of this study include the use of a non-probable sample. Understanding some culturally relevant predictors of tobacco use might assist health care providers in designing successful smoking cessation programs.

			hookah, among the mentioned target population.	the area of hookah smoking.	
9. El-Shahawy & Haddad, 2015	Cross-sectional study	Arab immigrant smokers Self identified N=131 Convenience sample	To explore the potential differences between exclusive cigarette smokers and dual smokers, in terms of nicotine dependence and barriers to cessation, among Arab Americans.	1. There was significant difference between exclusive smokers and dual smokers in their FTND scores and Barriers to Cessation scores. 2. The correlation between the FTND scores and Barriers to Cessation scores remained significant only in the dual smokers group. 3. There was no significant correlation between barriers to cessation and desire to quitting or confidence in ability to quit smoking in either group, 4. Dual smokers had significantly more barriers to cessation than exclusive cigarette smokers.	Nonrandom sampling The study was conducted on Arab Americans; thus its results should be interpreted carefully when translated to other immigrant groups or the general population of exclusive cigarette and dual smokers.

				5. There was a highly significant correlation among FTND scores, Barriers to Cessation scores, and past quit attempts among dual smokers.	
10. Haddad et al., 2012	Cross-sectional exploratory study	Arab Americans N=221 Convenience sample	To explore the cigarette use patterns including current use, beliefs and attitudes, and acculturation among Arab immigrants in Richmond.	1. Cigarette Smoking rates were higher among the study sample than the general population of the state of Virginia. 2. Many smokers in this study had the desire to quit and attempted to quit. 3. Many initiated smoking at an early age. 4. The smokers in the study sample were not likely to be aware of the resources that could have helped them quit. 5. Acculturation indicators measured in this study were found to be positively correlated with the number of smoked cigarettes per	Non-random sample: further random sampling and study is needed to confirm the high prevalence of tobacco use among this minority group The acculturation effect was assessed using a rough proxy measure and not a proper psychometric tool. The identification of tobacco use and other related patterns that would be identified here may help facilitate the development of community based interventions targeting tobacco use and would be sensitive for Arab immigrants in future research.

				day, as well as the number of attempts to quit by Arab immigrants. 6. The older an individual was when moved to the U.S. or the more time an individual had spent in the U.S. contributed significantly to the least number of quit attempts.	
11. Haddad & Corcoran, 2013	Pilot study Intervention study	Arab American smokers Men N=8 Convenience sample	1. To develop a culturally-tailored and linguistically-sensitive Arabic language smoking cessation program 2. To evaluate the feasibility of recruiting Arab Americans through a faith-based community organization which serves as a neighborhood social center.	Out of 11 participants, eight decided they were ready to stop smoking and moved from Stage One, subsequently completing all five stages. The results suggest that it is possible to reach smokers from Arab American communities with a tailored Arabic language smoking cessation program	The findings of this report will be used as the basis for a large-scale intervention study of a culturally and linguistically sensitive cessation program for Arab American ethnic groups. The generalizability of the findings is potentially limited because a small sample of convenience was used. A self-report reduction and cessation instrument was used without any biological validation resulting in recall bias

					and inaccurate reporting. There was no randomized control group employed and no long-term follow-up involved, thus participants' quit rates over time is not known.
12. Haddad et al., 2014	Cross-sectional study	Arab Americans Smokers N=154 Convenience sample	1. To examine the barriers to cessation among dual users of cigarettes and waterpipe. 2. To increase our understanding of the barriers to cessation among dual users. 3. To gain perspective regarding the similarities and differences of either dual or exclusive smokers' barriers to cessation and quitting behaviors.	1. Dual smokers appeared to have more barriers to cessation than either of the other two groups: exclusive cigarette and exclusive waterpipe smokers. 2. Dual smokers appeared to have fewer concerns for the harm of smoking than exclusive smokers of either cigarettes or waterpipes 3. Exclusive cigarette and waterpipe smokers had similar mean barriers to quitting and were more concerned about their health than dual smokers.	This study suggests a need for future research to focus on dual tobacco use, as it could become more prevalent and would pose specific challenges to cessation efforts. Convenience type of sampling is vulnerable to potential response biases that might affect the result thus limiting the generalizability of the study results.
13. Islam & Johnson, 2003	Cross-sectional survey study	Arab Americans Muslim adolescents Males and females N=480	1. To examine the smoking prevalence. 2. To investigate the associations of known smoking risk factors,	1. Smoking rates reported in this survey are much higher than those previously reported by other researchers for the	The results of this study are based on students' self-reports of their smoking behavior.

			religious and cultural influences with adolescents' susceptibility to smoking and experimentation with cigarettes among the ethnic group of Muslim Arab-American adolescents.	different ethnic groups of Arab youth. 2. There appeared to be similarities and variations in the associations between factors influencing susceptibility to smoking and those influencing experimentation for this sample of Muslim Arab-American adolescents. 3. Positive beliefs about smoking remained significantly associated with both susceptibility and experimentation for both genders. 4. Perceived negative consequences significantly protected adolescents from susceptibility and experimentation. 5. Consistent with previous studies, being male was significantly associated with an increased risk of susceptibility and experimentation Cultural and religious factors investigated in	The results are also based on cross-sectional data, so causal influences cannot be determined.

				this study appear to have a significant influence on adolescents' smoking behavior.	
14. Jamil et al., 2009	Cross-sectional exploratory study	Three groups: Chaldean, Arab American and non-Middle Eastern White adults. N=3543 Convenience sample	To compare and contrast personal characteristics, tobacco use (cigarette and water pipe smoking), and health states in Chaldean, Arab American and non-Middle Eastern White adults attending the same urban community service center.	1. The three groups differed significantly on ethnicity, age, gender distribution, marital status, language spoken, education, employment, and annual income. 2. Current cigarette smoking was highest for non-Middle Eastern White adults and current water pipe smoking was highest for Arab Americans. Arab Americans were more likely to smoke both cigarettes and the waterpipe. 3. Health problems were highest among former smokers in all three ethnic groups. 4. Being male, older, unmarried, and non-Middle Eastern White predicted current	A major limitation is the use of convenience sampling, it is not clear to what degree the sample, although it is a fairly large one, is representative of the populations from which it was drawn. Another concern was the uneven participation of the ethnic groups; the largest number were Arab Americans. There is a problem with the limited amount of information on tobacco use patterns and trajectories in these three ethnic groups. Another limitation is the limited amount of information on tobacco use patterns and trajectories in these three ethnic groups.

				cigarette smoking; being Arab or Chaldean and having less formal education predicted current water pipe use.	
15. Kassem et al., 2015	Descriptive cross-sectional study	Arab-American adults N= 458 Convenience sample	To examine initiation, pros and cons of hookah tobacco smoking among Arab Americans.	Irrespective of sex, most participants initiated hookah tobacco use by young adulthood in private homes or hookah lounges influenced by friends and family. Women initiated hookah use later than men. Ever dual smokers (hookah smokers who ever smoked a cigarette) initiated hookah use later than cigarettes; however, early hookah initiators < 18 years initiated hookah and cigarettes concurrently. Participants enjoyed the flavors of hookah tobacco, and complained about coughing, dizziness, and headaches.	Cross-sectional design which limits the ability to establish causality. A convenience sample was used; therefore, findings of this study may not be generalizable to other Arab-Americans. Data were collected through selfreport,which is subject to social desirability response bias.
16. Kulwicki & Rice, 2003	Qualitative Focus group interviews	Arab American adolescents	1. To gather information on Arab American adolescent tobacco use	1. Sociocultural factors are considered key factors in smoking	The findings from this study have several implications for nurses

		N= 28 Convenience sample	behavior. 2. To use the information to modify the Project Toward No Tobacco Use cessation program so that it would reflect the cultural values of Arab American youths.	behavior of adolescents. 2. Participants identified one of the strongest barriers they experienced in trying to quit as their concern about hanging around friends who smoked. 3. Most adolescents participating in the focus group discussions were exposed to smoking at a young age. 4. Focus group participants had no difficulty obtaining cigarettes. 5. When asked about the dangers of smoking, almost all participants had knowledge about the dangers of smoking, but most did not care about the long-term negative effects.	designing and implementing tobacco use programs for Arab American adolescents. Cultural attitudes and behaviors, family and peer relationships, and patterns of smoking are significant factors to take into consideration when developing a smoking cessation programs.
17. Kulwicki et al., 2007	Descriptive study	Pregnant women N= 830 (823 Arab	To determine the prevalence of smoking behavior in a select	Approximately 6% of pregnant Arab Americans smoked during	Nurses who care for Arab American pregnant women can use this

		Americans)	sample of Arab American women in order to eventually develop culturally appropriate prenatal health promotion and smoking cessation program for Arab American pregnant women.	pregnancy. The prevalence of smoking behavior among pregnant Arab American women was similar to that of smoking behaviors of Hispanics and Asian Americans in the United States. Cultural factors that support healthy behavior during pregnancy in the Arab culture seem to limit the use of tobacco in pregnant women.	information to better inform their care of patients.
18. Rice & Kulwicki, 1992	Interviews Self report survey	Arab Americans Males and females N=237 Random sample	To examine the prevalence and characteristics of cigarette smoking in a randomly selected sample of Detroit area Arab Americans.	1. Statistical examination of smoking status by demographic characteristics revealed group differences based on age, sex, and ethnicity. 2. Results indicate a current smoking rate of 38.9 percent, a former smoking rate of only 11.1 percent, a never smoking status of 50 percent, and a quit ratio of 22.2 percent.	This study shares the limitations of other studies of smoking behavior that rely solely on self-reports. Another concern is the disproportionately higher number of women to men in the sample.

				3. No demographic differences were found for strength of habit, but length of smoking habit was positively related to age and level of education.	
19. Rice et al., 2003	Four pilot studies: 3 descriptive and 1 pretest-post-test	Arab American adolescents N= 28; 9; 44; 119	To determine the: 1. current tobacco use patterns and predictors among 14- to 18-year-old Arab-American youths; 2. psychometric properties of study measures (English and Arabic); 3. cultural appropriateness of Project Toward No Tobacco (TNT) for intervention; 4. Accessible population for a longitudinal study.	1. Seven themes emerged from the data. 2. Pilot Intervention: a 37.5% cessation rate was found. 3. In the Pilot Clinic study, 24% males and 17% females smoked. 4. The current smoking rate in the Pilot School sample was 17%; 34% admitted to having ever smoked (even a puff). 4. Significant predictors for current tobacco use included poor grades, stress, having many family members and peers who smoke, being exposed to many hours of smoking each day,	The four pilots contributed unique and essential knowledge for designing a longitudinal clinical trial on tobacco use by Arab American adolescents.

				receiving offers of tobacco products, advertising and mail, and believing that tobacco can help one to make friends.	
20. Rice, 2005	Intervention study Theory driven community-based program	9th grade Arab American adolescents	1. To examine cultural, personal, social, and environmental forces operating in Arab American youth who are at risk for becoming habitual tobacco users and to test the effects of a cessation intervention on smoking behavior at 3, 6, and 12 months post-intervention. 2. To include testing a combined tailored prevention/cessation intervention (Project TNT-2) in Arab American 9th grade students as well as the teen clinic patients. 3. To collect prevalence data from 9th–12th graders.	9 Study measures were translated, back translated, and pilot tested by using established procedures to determine cross-cultural reliability and validity.	The abstracts and papers (all of which include some or many of the above factors) following this article were presented at the conference and provided data on Arab-American adolescent tobacco use that were collected over the past four years. In addition, these papers look at cultural subgroups' smoking behavior.
21. Rice et al., 2006	Cross-sectional	Arab American adolescents	To evaluate a number of predictors (personal,	1. 29% of the youths reported ever cigarette	A major limitation is the use of convenience

	survey	N= 1671 Convenience sample	psychosocial, sociocultural, and environmental) for tobacco use in Arab American adolescents.	smoking. 2. Experimentation with narghile was 27%; it increased from 23% at 14 years to 40% at 18 years. 3. Ten predictors were found for 'smoked a cigarette in past 30 days' and nine and seven, respectively, for 'ever smoked a cigarette or narghile'. 4. Friends and family members smoking were the strongest predictors of cigarette smoking and 'ever narghile use'.	sampling. It is not clear that this sample, although it is a very large one, is representative of the Arab American community from which it was drawn. Another concern was the uneven participation of the age groups
22. Rice et al., 2007	Cross-sectional survey study	Arab American and Non-Arab American Adolescent students N= 1455	To assess tobacco use and its predictors.	1. Use of cigarettes by Arab American youth were 1%, 2% and 9%, respectively compared to 5%, 9% and 27%, respectively, for non-Arab youth. 2. In contrast, narghile use was 8%, 12%and 36% for regular, last 30 days, and experimental use, respectively, by	Further research is needed into this form of tobacco use that is spreading rapidly into the non-Arab community. Further exploration and direction for the development of community prevention and cessation programs in the very young.

				Arab American 9th graders compared to 3%, 4% and 11%, respectively, for non- Arab youths.	
23. Rice et al., 2010	Quasi-experimental design Non-equivalent three-group posttest design	Adolescent smokers N= 380 Arab American & N= 236 non-Arab American	To test a modified Project Towards No Tobacco (TNT) use program on cigarette smoking.	1. Tenth graders given the intervention in the prior year reported a significantly lower rate of ever use at 23.3%. 2. Students who had received the intervention were 1.43 times less likely to have smoked in the past 30 days. 3. The effect of the intervention on regular use was in the predicted direction, but the difference was not significant. 4. The main effects for ethnicity were significant for cigarettes and water pipe smoking (ever, current, and regular). 5. Non-Arab students were 2 to 4 times more likely to engage in cigarette smoking than their Arab American counterparts.	These findings provide support for a school-based intervention revised to focus on prevention as well as cessation and to be culturally consistent. There is need for further research and intervention tailoring to address the problem of water pipe smoking in a growing Arab American adolescent population.
24. Templin et	Cross-	High school students	1. To estimate the	The rates of cigarette	The conclusions we

al., 2005	sectional quantitative study	N= 2454 (1567 Arab Americans)	prevalence of different forms of tobacco use including narghile use (water pipe) in two suburban high school populations in an ethnically diverse, but predominantly Arabic, adolescent population. 2. To examine the relationships of cultural and behavioral variables to reported adolescent tobacco use behavior. 3. To compare the ethnically diverse Michigan data to national data.	smoking observed in Arab youth were not higher than those reported for non-Arab youth, in fact, the rates were significantly lower. In contrast to cigarette use, narghile use was higher in Arab youth for each of the outcome categories, experimentation, social use, and addictive use.	present are tentative because additional data have yet to be analyzed. Another limitation is the self reporting bias.
25. Weglicki et al., 2007	Cross-sectional survey study	Adolescents N= 2782 (71% Arab American) Convenient sample	To examine tobacco use, (ie, cigarette smoking and WPS in a sample of adolescents attending high school with a large immigrant Arab population.	1. Cigarette smoking rates were significantly higher for non-Arab American youth for experimenting, current, and regular use 2. Cigarette smoking rates for non-Arab youth were lower than current national youth smoking rates but significantly higher than Arab American youth.	There are no known studies of waterpipe smoking rates for non-Arab US youth. These results underscore the importance of assessing novel forms of tobacco use, particularly waterpipe smoking, a growing phenomenon among U.S. youth

				3. Rates for Arab American youth were much lower than current national reported data. 4. Rates of waterpipe smoking for U.S. youth, regardless of race or ethnicity, are not known. 5. Findings from this study indicate that both Arab American and non-Arab youth are experimenting and using waterpipe smoking regularly. 6. Grade, ethnicity, and sex were significantly related to waterpipe smoking.	
26. Weglicki et al., 2008	Cross-sectional survey study	High school students Males and females N= 1872 (70% Arab American) Convenience sample	1. What are the tobacco use (cigarette and water pipe) patterns and percentages in Arab American and non-Arab American youth aged 14–18 years? 2. Which of the demographic and cultural factors of age, school grade, gender, and ethnic	1. Arab American youth reported lower percentages of ever cigarette smoking, current cigarette smoking and regular cigarette smoking than non-Arab American youth. 2. Arab American youth reported significantly higher percentages of	A major limitation is the use of convenience sampling. A more equal distribution may have provided different smoking percentages and patterns by ethnicity, gender, and patterns of tobacco use

			identity predict current cigarette and/or water-pipe smoking in Arab American and non-Arab American youth?	ever waterpipe smoking and current waterpipe smoking than non-Arab American youth. 3. 77% perceived waterpipe smoking to be as harmful as or more harmful than cigarette smoking. 3. Youth were 11 times more likely to be currently smoking cigarettes if they currently smoked water pipes. 4. Youth were also 11 times more likely to be current waterpipe smokers if they currently smoked cigarettes.	Further research is needed to determine the percentages, patterns, and health risks of waterpipe smoking and its relationship to cigarette smoking among all youth.

Data Synthesis

Smoking Prevalence

Smoking prevalence among Arab Americans is high and ranges from 39% to 69%; rates are also higher in males than in females.[10,11,43-45] Rice et al.[11] conducted one of the earliest studies on Arab Americans and smoking. They surveyed 237 Arab Americans in Detroit, Michigan about their smoking behaviors. The majority of the sample were female (70%), Lebanese (75%), and born in the Middle East (97%), with an average stay in the US of 12.2 years. The authors found that 38.9% of the sample were current smokers, 11.1% were former smokers, and 50% had never been smokers; the majority of the current smokers were between the ages of 25 and 34 years, which was significantly different from the majority of former smokers who were older than 55 ($p<.002$). In addition, Arab Americans in this sample had a higher smoking rate (38.9%) and a lower quitting rate (11.1%) compared to national data (28.9% smoking rate; 23% quitting rate) and State of Michigan data (29.2% smoking rate; 25.5% quitting rate).

In a cross-sectional study conducted in Richmond, Virginia,[10] 69% of the 221 Arab American participants reported being current smokers. The authors defined current smokers as "having smoked at least one cigarette per day during the past 30 days" (p.787). In addition, men (67.6%) had higher rates of smoking than women (32.2%), and respondents who were born in Iraq or had parents who were born in Iraq had higher smoking rates than those who were born in other countries. Most of the participants (65.7%) grew up in homes with fathers who smoked cigarettes. Similarly, exclusive water-pipe smoking prevalence was high (44.2%) in this sample as well dual-smoking prevalence (e.g., smoking cigarettes and water-pipe) (55.8%).[42]Similar to the reported prevalence of cigarette smoking, more male participants (66.6%) reported exclusive

cigarette smoking than female participants (31.4%) while both groups reported experimenting with water-pipe smoking as young as 12 years of age.

In another study that examined smoking behaviors in 823 pregnant Arab American women who participated in the low-income nutritional supplemental program Women, Infants, and Children during the year 2002 in Michigan, 6% of the sample reported smoking while being pregnant.[46] The sample consisted of a majority of women between the ages of 20-29 (56.7%) with a high school education (50.5%). The reported low birth weight babies in the sample was 5.3%. Both rates of smoking prevalence during pregnancy (6%) and low birth weight babies (5.3%) in Arab American pregnant women were lower than Michigan state (29%; 7.4%) and national statistics (20%; 8.4%), respectively.

Smoking, both cigarettes and water pipe, has also been highly prevalent among Arab American adolescents. Few studies, however, have been conducted in the US to examine the prevalence of dual smoking and associated risk factors in this population. In a study evaluating tobacco use in Yemeni-American adolescents, researchers reported significant positive effects of age ($p=0.03$), parental smoking ($p=0.01$), peer smoking influence ($p=0.001$), and early age experimentation with tobacco ($p=0.01$) on tobacco use, and a significant negative effect of educational performance ($p=0.04$) on tobacco use.[41,47] In a sample of 297 Yemeni-American adolescents between the age of 14 and 18, 39% had tried tobacco and 17.2% were currently smoking water pipe. Water-pipe use was nine times as likely to be present among those who were experimenting with tobacco than among those who were not. Surprisingly, water-pipe smoking was not correlated with parental tobacco use.[41] Similarly, Islam and Johnson[49] performed a cross-sectional survey of 461 Muslim Arab American adolescents (12 to 19 years of age) in Virginia and were able to calculate the prevalence of susceptibility to smoking (50%),

experimentation (e.g., having "ever" smoked) (45%), smoking in the last 30 days (18%), and current smoking (12%) in young adults. Males reported smoking experimentation at twice the rate as that reported by females. The authors also reported several significant risk factors associated with both susceptibility to smoking and experimentation with smoking such as peer pressure, perceived peer norms, and culturally based gender-specific norms ($p<0.05$). Religious influence and perceived negative consequences of smoking were significant protective factors in this sample ($p<0.05$). When susceptibility to smoking was analyzed by gender, religious influence was a protective factor for female participants ($p=0.002$) but not for male participants ($p>0.05$), and gender-specific norms were a risk factor for male participants ($p=0.02$) but not for female participants ($p>0.05$).

Weglicki et al.[49,50] conducted a study to compare cigarette and water-pipe smoking between Arab and non-Arab American youth. The sample consisted of 1872 students from Midwestern high schools; 70% of the sample were Arab Americans. Compared to non-Arab American adolescents, Arab Americans had significantly lower rates of cigarette smoking (ever and current) (20.1% and 6.9% versus 39.3% and 21.9%, respectively; $p<0.01$) but a significantly higher rate of water-pipe smoking (ever and current) (38% and 16.7% versus 21.3% and 11.3%, respectively; $p<0.01$). In addition, participants who reported family members smoking water pipes at home were 6.3 times more likely to be current water-pipe smokers.

El Hajj et al.[51] conducted the latest study in Colorado to examine tobacco use among Arab immigrants living in Colorado and the effect of some cultural predictors such as socioeconomic status on the smoking prevalence in this population as well as understanding the effect of acculturation on their tobacco use. The sample consisted of 100 adult Arab immigrants living in Colorado. The results showed that 19% of the participants were current cigarette

smokers which is higher then the state average (16%) and 21% were current hookah smokers. When compared with the population in Colorado, Arab immigrants were twice as likely to use tobacco products. Participants in the sample who were more integrated into Arab culture were more likely to use tobacco products (p=.03), to be current hookah smokers (p=.008), to have family members who smoke cigarettes (p=.02) and friends who use tobacco products (p=.007). In addition, analysis showed that Arabic culture was the best predictor of family members who smoke cigarettes (R2=.047) and of having friends who smoke hookah (R2=.091).

Smoking Cessation

Few researchers have addressed smoking cessation attempts among Arab Americans. Athamneh and colleagues[52] conducted a study in Houston, Texas to investigate the predictors of intention to quit water-pipe smoking among Arab American adults (n=340) and found that only 27% of the sample reported having the intention to quit. There was no significant relationship between the intention to quit water-pipe smoking and gender, income, marital status, or education. Several factors were associated with lower intentions to quit smoking; these included older age, cultural acceptability of water-pipe smoking, and perceptions of water-pipe smoking as less harmful than cigarette smoking. In another study, several barriers to smoking cessation and water-pipe use were reported among Arab Americans. El-Shahawy and Haddad[53] investigated the correlation between nicotine dependence and barriers to smoking cessation in a sample of 131 Arab Americans smokers living in Richmond, Virginia. The mean age for the sample was 28 and females comprised 28.6% of the sample. The authors found a significant difference in nicotine dependence between the exclusive cigarette smokers (Mean score for nicotine dependence=2.55) and the dual-smokers (cigarettes and water pipe; Mean score for nicotine dependence=3.71), who had a significantly higher nicotine dependence (p=0.006).

Similarly, the barriers for smoking cessation such as "fear of failing to quit," "thinking about never being able to smoke again," "gaining weight," or "no encouragement or help from friends," were significantly higher for dual smokers compared to exclusive cigarettes smokers (Mean scores for barriers to cessation=45.21 vs. 38.47; p=0.005). In another study conducted in 2016, the authors[54] examined the effect of theory of planned behavior (TPB) constructs on the intention to quit water pipe smoking among 340 Arab Americans adults in Houston. The study sample consisted mainly of males (67%) and married (50%) with a mean age of 30 years. Out of the 340 Arab American water pipe smokers, only 27.43% (n=93) reported having an intention to quit. In the study, analysis showed that only half the constructs of the TPB were significantly associated with the intention to quit water pipe smoking; that is, behavioral evaluation and subjective norms.

To date, few interventions have been developed to facilitate smoking cessation in Arab Americans. We were able to identify one smoking cessation program in Arab American adolescents[12,55] and one in Arab American men.[56] The first study, which targeted Arab American adolescents, used an intervention titled the *Project Toward No Tobacco Use* (*Project TNT)*, which was culturally-tailored in collaboration with ACCESS, the Arab Community Center for Economic and Social Services in Detroit, Michigan, which is home to the largest Arab American community in the US.[12,55] The *Project TNT* intervention has helped many Arab American adolescents stop smoking, and the results have been published in 7 articles.[12,43,44,56-58] The intervention, which was composed of educational materials on smoking cessation, was tailored for youth through interactive power point presentations and video clips; the program was provided in both Arabic and English languages and featured Middle Eastern and non-Middle Eastern figures.[53] Students who received the intervention reported a significantly lower rate of

ever use of cigarette smoking after one year at 23.3% (Odds Ratio [OR]=1.31, 95% CI: 1.05, 1.64). Students who received the intervention were also 1.43 times (95% CI: 1.03, 2.01) more likely to abstain from smoking in the past 30 days than those who did not receive the intervention. In addition, the authors discussed that post-intervention, Arab American adolescents reported greater experimentation with water-pipe smoking than cigarettes (38% vs. 22%), and more current (16% vs. 6%) and regular (7% vs. 3%) use of water pipes than cigarettes, respectively. The water-pipe experimentation post-intervention probably occurred because the intervention targeted cigarette use only. Thus, future interventions in Arab American adolescents should target water-pipe smoking as well as cigarette smoking cessation.

The second intervention, which targeted Arab American adults, was conducted in Virginia and aimed at the development and pilot testing of a culturally-tailored and linguistically-sensitive Arabic-language smoking cessation program.[57] The intervention utilized the *How to Quit Smoking in Arabic* (HQSA) program and was comprised of 5 stages over a total of 12 weeks. Out of the 11 male participants who participated in the pilot study and completed all stages of the intervention, 8 reported that they were ready to stop smoking and 3 had stopped smoking by the three-month follow-up. Participants also provided feedback that helped in evaluating and revising the intervention to meet the cultural and linguistic needs of the Arab American population. Some of the feedback mentioned the use of a few colloquial terms that varied among different Arab nationalities, including the use of the word “In Sha’allah” (if God wills), as well as the difficulty in keeping up with a journal for daily activities, which is not part of Arab culture.

The two interventions demonstrated promising results for smoking cessation in Arab American populations. However, the results also highlighted the need for additional research and

intervention studies to address the studies' limitations. For example, the intervention targeting Arab American adults was a pilot study of 11 participants and was limited to males who were all recruited from one faith-based center. Data were collected based on self-report and no biological validation was used. Future studies should include diverse recruitment strategies, inclusion of Arab American women, and biological measures to validate the results of smoking cessation interventions.

Acculturation and Smoking

Acculturation, which is the continuous process of interaction between different cultures, can influence health-related behaviors such as smoking, especially over time.[9,16,30,36] Although measuring the degree of acculturation is complex, researchers have either used validated instruments that can capture aspects of the acculturation process, or proxy indicators such as length of stay in the country or the language spoken at home. For example, one study used three proxy indicators for acculturation (language spoken at home, number of years in the US, first language learned) and found that the number of years spent in the US and the age when an individual moved to the US were positively correlated with the number of smoked cigarettes per day ($F=3.4$, $p<0.00$). Similarly, these factors were negatively correlated with the number of attempts to quit smoking (OR=0.93, CI: 0.87, 0.98; and OR=0.93, CI: 0.88, 0.98 respectively).[10]

In another cross-sectional study,[58] 96 Arab American smokers (71%) and ex-smokers (29%) were recruited from the Midwest area; the sample consisted of mostly men (81.3%) who had lived in the US for five years or more (62%) and were approximately 35 years of age. The findings revealed a significant positive correlation between acculturation and tobacco dependence as well as between tobacco exposure and tobacco dependence.[59-60] Acculturation was measured using the Male Arab American Acculturation scale that has four subscales

(separation, assimilation, integration, and marginalization). There was a positive significant correlation between separation versus assimilation and nicotine dependence (r=0.18, p<.05) but no significant relationship between integration and marginalization and nicotine dependence. Indeed, Arab Americans who behaved like and spent the most time with their ethnic peers were more dependent on nicotine.

Health Beliefs and Smoking

Individuals' health beliefs that are related to their susceptibility to or severity of a disease, as well as their beliefs of the barriers and benefits of certain health behaviors, strongly influence health behaviors such as smoking.[61] In a study by Haddad and colleagues,[10] 59.3% of respondents who were asked about general harmful effects of smoking stated that it had no harmful effects; in addition, fewer than 33% of respondents were concerned about the negative effects of smoking on their health. Prestige and social acceptance in the new culture were the most frequently reported reasons for smoking. Of the 69 participants who were non-smokers, only 7 reported that the harmful effects of smoking were good reasons to avoid the habit. None of the studies found and included in this review applied a model such as the Health Belief Model, which is an effective tool in examining smoking behavior and barriers to cessation in Arab Americans.

Sociocultural Factors and Smoking

In addition to health beliefs, sociocultural factors play a key role in the smoking behavior of adolescents. In a qualitative study that explored opinions about tobacco use and cessation programs among 28 Arab American adolescents, the authors[58] reported that being cool, hanging out with friends, easy accessibility to cigarettes, and feeling good after smoking were the reasons adolescents chose to smoke. Additionally, one of the main barriers to smoking cessation was

having friends who smoke. Despite awareness of the dangers of smoking, the adolescents were mainly concerned with the present effects of smoking on their health, such as the possibility that their growth might be stunted or that they would be unable to play sports. In another study, Kassem et al.[61] examined the initiation, and pros and cons of hookah use in a sample of 458 adult Arab Americans (mean age: 28.4 years). Results showed that 41.2% of the participants first tried hookah smoking at an age younger than 18 years, and the majority were with friends when they first tried hookah smoking. However, early hookah initiators were 1.9 times more likely than late hookah initiators to be with family when first tried hookah (p= .004). A total of 61.2% of participants were 'ever dual smokers' while 31% were 'current dual smokers' and men were more likely than women to be current dual smokers (p=.035). Participants mainly enjoyed the flavors of hookah tobacco, and their major complaints were coughing, dizziness, and headaches.

Discussion

The reviewed studies in this systematic review showed that smoking, both cigarettes and water pipe, is highly prevalent among Arab Americans. Investigating the acculturation process among immigrants has been an increasingly important topic in multicultural research and in understanding the health outcomes of the immigrant populations in the US. Acculturation has been linked to health behaviors and health outcomes among immigrants.[9,30,36] According to the research, Arab Americans have high rates of smoking and low rates of smoking cessation.[11,60] In addition, because they are ethnic minority immigrants, they are vulnerable to a range of health disparities, such as high rates of smoking, obesity, and low rates of yearly regular checkups, which can negatively affect their health outcomes in the long-term. Strong evidence is available to support the existence of health disparities among ethnic minorities in the US and its impact on their health outcomes.[61,62] These disparities are related to several intersecting factors including

the language barrier, lack of resources, education, acculturation, poverty, immigrant status, lack of health insurance, discrimination, and cultural and religious factors.[63] In addition, Arab Americans are a very heterogeneous group from diverse socio-economic backgrounds and can be found in all fifty states across the US. The reviewed studies were mostly conducted in the Midwest near Michigan and in Virginia. The findings of these studies do not adequately represent Arabs in the US. Michigan, for example, has one of the highest populations of Arabs in the US; however, this population represents a disproportionate amount of lower-income Arab Americans compared to other Arab Americans living in different states.[64]

Despite the increasing numbers of Arab Americans in the US and their high rate of smoking prevalence, findings of this systematic review reveal that limited research has been conducted on smoking behavior in Arab Americans. Of the studies that exist, the majority focused on smoking prevalence, smoking cessation, acculturation, and health beliefs in Arab Americans adolescents. To date, only two smoking cessation programs have been developed for Arab Americans, despite the high prevalence of both cigarette and water-pipe smoking in this community. The review also demonstrated that there have been no studies conducted in the US investigating the relationship between acculturation, smoking behavior, and cancer in Arab Americans.

Gender and religion are other important factors that need to be addressed in Arab American studies. Most studies reviewed showed that males had higher smoking rates than females for both cigarette and water-pipe smoking. A study examining Muslim US students also reported that males were twice as likely to be lifetime water-pipe smokers than females.[65] Male dominance, gender roles and norms, and patriarchy in Arab societies can be interpreted as some of the reasons for gender differences in smoking; however, more studies that specifically

investigate these gender differences are needed, while controlling for other socio-demographic variables. In the reviewed studies, religion, religiosity, and their impact on daily life and health behaviors, specifically smoking, have not been addressed. Despite the fact that Arabs in the Arab world are mostly Muslims, Arabs in the US are mostly Christians.[66] In addition, cultural traditions and religion are very entangled among Arabs, thus making it difficult to differentiate whether a specific behavior is supported by the culture or the religion. For example, fatalism and total reliance on God's will are common beliefs of both Muslim and non-Muslim Arabs,[67] making these important factors influencing certain health beliefs and behaviors such as smoking and its association with cancer. Therefore, religion and religiosity are also important to address in future studies investigating smoking and smoking cessation in Arab Americans.

This systematic review signifies the need for future studies focusing on determining the health beliefs and sociocultural factors that influence smoking prevalence in Arab Americans, and the effect of acculturation on smoking rates over time in order to develop culturally appropriate smoking cessation interventions for this population. In addition, future research needs to address the limitations of present studies by including female participants, expanding recruitment strategies, examining a broader range of geographical areas, and conducting additional research on water-pipe smoking. In this way, researchers in health promotion can develop interventions to reduce the high rates of smoking among Arab Americans as well as prevent diseases such as cancer, stroke, heart disease, and diabetes in both primary smokers and their family members, who are exposed to second hand smoke.

Conclusion

Evidence clearly exists that establishes a connection between high smoking rates and health disparities. To our knowledge we are the first to review Arab American smoking behavior.

This systematic review provides a description of Arab Americans' smoking behavior, specifically focusing on the relationship between this behavior and the acculturation level and health beliefs in this population. Findings demonstrated the scarcity of research on smoking in Arab Americans. This knowledge gap has impeded the development of interventions that aim to improve health outcomes and reduce health disparities in this vulnerable, ethnic minority population. Given the rapid increase of Arab American residents in the US, more research about the smoking beliefs, behaviors, and cessation attempts of this population is warranted.

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Chapter III

Study Findings

Smoking Behavior in Arab Americans: Acculturation and Health Beliefs

Abstract

Introduction: Arab Americans, a growing population in the U.S., have high rates of smoking and low rates of smoking cessation. In this study, we investigated factors influencing desire to quit smoking among Arab Americans, and their association with acculturation and health beliefs. **Methodology:** Cross-sectional descriptive study among adult Arab American smokers. Data were collected (n=96) to measure tobacco use, nicotine dependence, desire to quit smoking, acculturation, and health beliefs. **Results:** The sample included 55% female, mean age of 44 (±14.79). The desire to quit smoking was positively associated with perceived severity and susceptibility to cancer, perceived benefits of quitting smoking; and negatively associated with smoking barriers and nicotine dependence. Being female, having lower level of nicotine dependence, and higher perception of cancer severity predicted higher desire to quit smoking. **Discussion:** Smoking cessation intervention studies need to target appropriate health beliefs, especially cancer severity of smoking among male Arab Americans.

Smoking Behaviors in Arab Americans: Acculturation and Health Beliefs

Introduction

Health disparities exist in the United States (U.S.) population, particularly among ethnic minorities (Institute of Medicine, 2012). Risky health behaviors such as smoking and alcohol consumption are influenced by health beliefs and acculturation in these populations (Abraido-Lanza, Chao, & Florez, 2005; Choi, Rankin, Stewart, & Oka, 2008; Guthrie, Young, Williams, Boyd, & Kintner, 2002; Klonoff & Landrine, 1996; Zhang & Wang, 2008). In addition, minority status is associated with increased smoking rates among adults (CDC, 2001; 2013; Forzley, 2005); however, smoking prevalence in the U.S. differs noticeably among ethnic groups (CDC, 2006). Most studies on ethnic minorities report that acculturation may play a role in smoking among these populations and may also account for the racial/ethnic differences in their smoking rates (Arcia, Skinner, Bailey, & Correa, 2001; Hunt et al., 2004; Klonoff & Landrine, 1999; Thomson & Hoffman-Goetz, 2009; Zhang & Wang, 2008). Arab Americans, who comprise a growing population in the U.S., have high rates of smoking prevalence (39%-69%) when compared with U.S. average prevalence rate of 21%, as well as low smoking cessation rates (11.1%-22.2%) compared with U.S. average cessation rate of 23% (Haddad et al., 2012; Jamil, Templin, Fakhouri, Rice, Khouri, & Fakhouri, 2009; Rice, Templin, & Kulwicki, 2003; Rice & Kulwicki, 1992). The higher smoking rate in Arab American adults is largely because smoking is considered as a normative cultural behavior in Arabic culture, which they continue after their immigration to the U.S. (Al Omari & Scheibmeir, 2009). Research examining smoking cessation among Arab Americans is very limited. A recent systematic review (Ghadban, Haddad, An, Thacker, & Salyer, 2016) showed scanty of studies that examined smoking in Arab Americans. Of the studies that exist, the majority focused on smoking prevalence and smoking cessation.

Although some studies have addressed the impact of acculturation and health beliefs on smoking behaviors in Arab Americans adolescents, to date, only two smoking cessation programs have been developed for Arab Americans, despite the high prevalence of both cigarette and water-pipe smoking in this community (Al-Faouri, Weglicki, Rice, Kulwicki, & Jamil H, et al., 2005; Kassem et al., 2015; Rice, 2005; Rice, Templin, & Kulwicki, 2003). In addition, there are important gender differences in smoking behaviors among Arabs. Arab males in the U.S. and in the Arab world have significantly higher rates of smoking cigarettes and water-pipe than Arab females (Azab, Khabour, Alkaraki, Eissenberg, Alzoubi, & Primack, 2010; Haddad, El Shahawy, & Ghadban, 2014; Grekin & Ayna, 2012). However, more recently, studies are showing an increasing rate of waterpipe smoking among Arab women (Khalil, Afifi, Hammal, Jarallah, Mohamed, & Nakkash, 2013; Mohammad, Kakah, & Mohammad, 2008; Samet & Yoon, 2010).

With the limited empirical knowledge available regarding the impact of acculturation and health beliefs on smoking behaviors and smoking cessation among Arab Americans, there is a significant need for research in this area to be able to design theory-driven and culturally-relevant smoking cessation interventions for Arab Americans. Therefore, the overall purpose of this study was to investigate smoking behaviors and factors influencing the desire to quit smoking among Arab Americans. Our specific aims were 1) to explore the factors influencing desire to quit smoking among Arab Americans (i.e., gender, perceived susceptibility to and perceived severity of cancer, and perceived barriers and benefits of smoking cessation, acculturation level), and 2) to characterize gender differences in smoking behaviors, acculturation, perceived susceptibility to and perceived severity of cancer, and perceived barriers and benefits of smoking cessation among Arab Americans.

Conceptual Framework

Two theoretical frameworks were used to investigate the complexity of smoking behaviors and cessation among Arab Americans: the Health Belief Model (HBM) (Becker, 1974) and the Acculturation Model (Berry's Acculturation Model) (Berry, 1997, 2001). The integration of these two frameworks give value to individuals' experiences with immigration and acculturation while taking into consideration the complexity of the whole process; in addition, the HBM is based on the subjective beliefs and perceptions of health and illness of the population being studied (Figure 1).

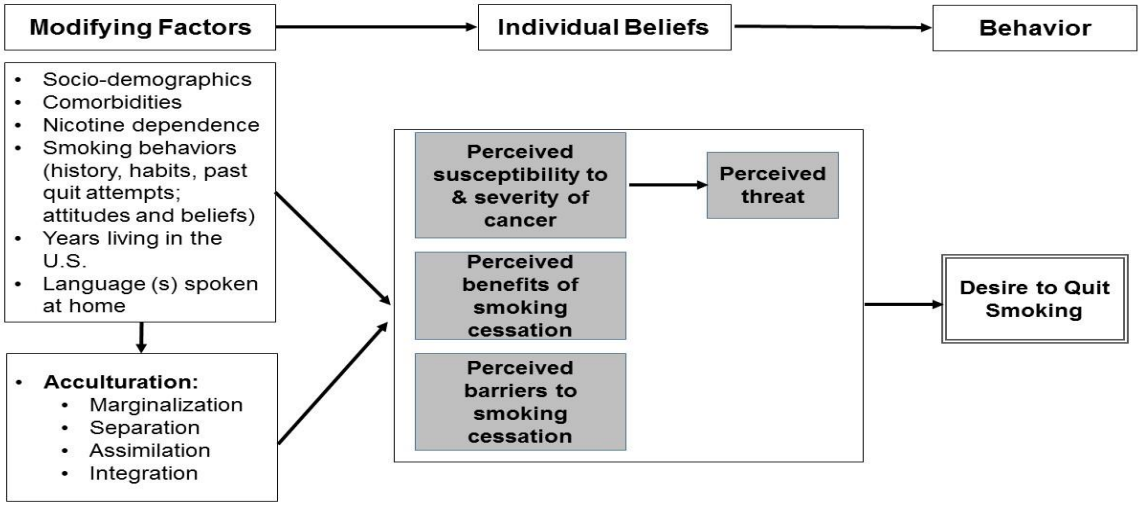

Figure 1. Conceptual Framework.

Methods

Design, Sample and Setting

We conducted a cross-sectional study using non-probability convenience sampling to recruit Arab Americans (N=96). Inclusion criteria were individuals who are: current smokers, 18

years of age or older, identify themselves as first, second or third generation Arab or Arab Americans, able to read and write English, and willing to participate in the study. Exclusion criteria were Arab Americans who are former or non-smokers and who moved to the U.S. less than three months prior to enrollment since these participants may have different immigration and acculturation experiences. Multiple outreach settings in Buffalo, New York were used to recruit the needed sample for the study including Buffalo private clinics, faith-based organizations, and Middle Eastern grocery stores, restaurants, and lounges. Buffalo has a large population of Arab Americans especially of Lebanese, Syrian, Egyptian, and Iraqi origins and the first author (RG) had access to this population through organizational networking.

Data Collection Procedures

Following Institutional Review Board approval from Virginia Commonwealth University, recruitment and enrollment was initiated. Individuals who showed interest in participation were screened either over the phone or face-to-face using a screening protocol.

The participants had the option to either have the questionnaire mailed to them (with a return envelope and the informed consent) or to complete the questionnaire in a meeting with the first author. For those who choose to meet in person, a convenient time and place was selected for the completion of the questionnaire. The questionnaires took approximately 30 minutes to complete.

Variables and Measures

Sample demographics. Age, gender, country of origin, years living in the U.S., marital status, language(s) spoken, level of education, annual income, employment, and co-morbidities (including cancer history for participant and family) were used to characterize the participants.

Smoking behaviors. Smoking history, smoking habits, past quit attempts, and attitudes

and beliefs toward tobacco use are measured using Tobacco Use Questionnaire (TUQ) (Petitti, Friedman, & Kahn, 1981). The TUQ is a self-report questionnaire that contains 31 questions about smoking history, smoking habits, past quit attempts, attitudes and beliefs toward tobacco use, and desire to quit. TUQ has shown high validity, high test–retest reliability (r=0.89) and high internal consistency (Cronbach's α=0.86) (Petitti et al., 1981) and it has been used among Arabs in the U.S. (Haddad et al., 2012; Rice, Templin, & Kelwicki, 2003).

Nicotine dependence. The Fagerström Test for Nicotine Dependence (FTND) is a 6-items scale used to measure the level of nicotine dependency or addiction. It assesses how soon tobacco use begins each day, which cigarettes during the day a person could do without, how smokers cope in places where they cannot smoke, and how frequently and how deeply they smoke. As a continuous variable, scores range from 0-10 and as an ordinal variable scores range from 0-2: very low dependence; 3-4 low dependence; 5: medium dependence; 6-7: high dependence; and 8-10: very high dependence. FTND has good test–retest reliability, convergent validity, and discriminant validity, the test–retest reliability coefficient values ranged from 0.65 to 0.72 (Rice et al., 2003). In our sample, Cronbach's α was 0.67. FTND has not been validated with water-pipe users.

Acculturation**.** The Acculturation Rating Scale for Arab Americans - II (ARSAA-II) was used to measure separation/assimilation and integration/marginalization. These scales have internal reliability coefficients (Cronbach's α) of 0.71 and 0.73, respectively (Barry, 2005). The ARSAA-II tool (8 items) assesses the participants' language use and preference, ethnic identity, cultural heritage and ethnic behavior, and ethnic interaction (between the American and Arabic cultures); it is divided into two 4-item subscales: Marginalization versus Integration (higher scores indicate integration) and Separation versus Assimilation (higher scores indicate

assimilation). Items are scored on a 7-point Likert-scale: (7=strongly agree; 1=strongly disagree). Scale scores are derived by summing reverse-scored and positive-scored scale items. In our sample, Cronbach's α for both subscales was 0.97.

Health beliefs**.** We measured the different constructs of the Health Belief Model (HBM): perceived susceptibility to cancer, perceived severity of cancer, perceived benefits of quitting smoking, and perceived barriers to quit smoking using scales that have been previously used (Al-Ali & Haddad, 2004). The investigator adapted the questions for the perceived susceptibility to cancer (7 items), perceived severity of cancer (9 items), and perceived benefits of quitting smoking (13 items) subscales from a study conducted in Jordan using the Health Belief Model to examine attitudes and beliefs toward exercise and myocardial infarction (Al-Ali & Haddad, 2004). In our sample, Cronbach's α for the subscales were the following: perceived susceptibility to cancer 0.80, perceived severity of cancer 0.51, and perceived benefits of quitting smoking 0.82. Perceived barriers to quit smoking were measured using the Barriers to Smoking Cessation questionnaire that was previously used among Arab Americans (El Shahawy & Haddad, 2015). It consists of 19 items and contains three subscales: Addiction Barriers subscale (eight items); External Barriers subscale (seven items); and Internal Barriers subscale (three items). In our sample, Cronbach's α coefficient for addictive barriers was 0.93, for external barriers 0.89, and for internal barriers 0.92; higher than what has been previously reported in other studies (0.84, 0.80, and 0.71 respectively) (El Shahawy & Haddad, 2015).

Desire to quit smoking. The outcome variable was measured using a single item from the TUQ (Petitti et al., 1981) that asks participants their desire to quit smoking on a scale of 1 to 10 (higher scores mean stronger desire to quit smoking). It has been previously used with Arabs in the U.S. (Petitti et al., 1981).

Data Analysis

SPSS version 24.0 was used to analyze the data. Initially, data were cleaned and exploratory analysis was conducted (including recoding of variables and computing of subscales and scales as needed). Descriptive statistics were used to characterize the sample and, t-test and Chi-square were used to examine gender differences regarding health beliefs, acculturation, desire to quit smoking, and demographic variables. Pearson r correlation was used to look at associations between our dependent and independent variables, including nicotine dependence. Multiple linear regression analyses were conducted to predict the relationship between desire to quit smoking, the dependent variable, and the predictor variables (gender, acculturation, perceived susceptibility to and perceived severity of cancer, perceived barriers and perceived benefits of smoking cessation and nicotine dependence). Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. A multiple regression with backward elimination was used to determine the most parsimonious model by eight step-wise approaches.

Results

Sample characteristics

The final sample was composed of 96 participants (45% males). The mean age was 44 (±14.79) and ranged from 19 to 73 years. More than half of the sample was married (52%), first generation (67.7%), with at least a college degree (74%), and working full time (55.2%). A family history of cancer was reported by 42.7% and 14.6% reported having been diagnosed with cancer. There were no significant difference between males and females on any of the demographic variables (age, marital status, generation, education, employment, annual income,

and medical history). Table 1 provides a summary of the findings for the total sample and by gender.

Table 1. Demographic Characteristics (N=96)

Variable§	Total N=96 (100%)	Females N=53 (55.2%)	Males N=43 (44.8%)	p-value
Age* (Mean ± SD)	(43.76 ± 14.79)	(44.47 ± 13.35)	(42.88 ± 16.51)	0.61
Marital Status**				0.18
Single	35 (36.5)	15 (28.3)	20 (46.5)	
Married	50 (52.1)	31 (58.5)	19 (44.2)	
Divorced/ Widowed	11 (11.4)	7 (13.2)	4 (9.4)	
Generation**				0.82
Born in Arab country and migrated to US	65 (67.7)	37 (69.8)	28 (65.1)	
Born in US and either parents born outside US	26 (27.1)	13 (24.5)	13 (30.2)	
Born in US and parents born in US	5 (5.2)	3 (5.7)	2 (4.7)	
Education**				0.10
Middle School	4 (4.2)	3 (5.7)	1 (2.3)	
High school graduate	21 (21.9)	14 (26.4)	7 (16.3)	
Some college or 2-year degree	21 (21.9)	15 (28.3)	6 (14.0)	
4-year college graduate	34 (35.4)	15 (28.3)	19 (44.2)	
More than 4-year college degree	16 (16.7)	6 (11.3)	10 (23.3)	
Employment**				0.09
Working full-time	48 (55.2)	25 (56.8)	23 (53.5)	
Working part-time	2 (2.3)	1 (2.3)	1 (2.3)	
Retired	20 (23.0)	12 (27.3)	8 (18.6)	
Student	12 (13.8)	2 (4.5)	10 (23.3)	
Housewife	5 (5.7)	5 (11.4)	0 (0.0)	
Annual Income**				0.76
< $25,000/year	9 (14.3)	3 (9.4)	6 (19.4)	
$25,000 and $50,000/year	4 (6.3)	2 (6.3)	2 (6.5)	
$50,000 and $75,000/year	10 (33.3)	6 (18.8)	4 (12.9)	
$75,000 and $100,000/year	21 (33.3)	12 (37.5)	9 (29.0)	
>$100,000/year	19 (30.2)	9 (28.1)	10 (32.3)	
Medical History				
Hypertension**	28 (29.2)	17 (32.1)	11 (25.6)	0.49
Diabetes**	12 (12.5)	5 (9.4)	7 (16.3)	0.31
Cardiac Problems**	8 (8.3)	3 (5.7)	5 (11.6)	0.29
Cancer**	13 (13.5)	6 (11.3)	7 (16.3)	0.48
Hyperthyroidism**	1 (1.0)	1 (1.9)	0 (0.0)	0.37

§Numbers (N) may not sum to total due to missing data
*t-test
**Chi-Square

Descriptive statistics for model variables

Smoking behaviors and nicotine dependence. All participants were smokers and the mean age at which they started to smoke was 19 (±2.99) with males starting at a significantly younger age than females (18±1.63 versus 20±3.7; $p<0.05$); 21% of males compared to 9.4% of females started smoking between the ages of 15 and 17 years old. Most of the sample reported smoking everyday (90.5%), an average of 7.77 (±8.51) cigarettes/day; 58% reported smoking water-pipe with females smoking it significantly more than males (73% versus 39.5%; $p<0.01$). Only 4.2% reported using E-cigarettes. The majority of the participants reported that their father smoked while growing up (84.4%). The majority of sample (84%) agreed that smoking is harmful to health and were very to fairly (73.5%) concerned about the harmful effects of smoking on their health. Participants reported that people smoke because of pleasure (58.9%), stress (25.3%), and social acceptance (14.6%).

Only 29.5% have ever thought of quitting smoking and only 28.4% have made a serious attempt to quit. Nicotine dependence, based on the FTND test, ranged from very low to high dependence: 55.9% scored very low, 10.2% scored low, 10.2% scored medium, and 23.7% scored high. Males scored significantly higher than females ($p<0.01$) on nicotine dependence; 39.4% of males scored very high on nicotine dependence compared to only 3.8% of females. Participants' confidence in not smoking after one year, on a scale of 0 to 10, was low (3.93±2.03), with males reporting significantly less confidence than females (3.2±1.95 versus 4.5±1.93; $p<0.05$). Females reported significantly higher numbers of attempts to stop smoking in the last two years than males (0.43±0.99 versus 0.12±0.33; $p<0.05$).

Table 2. Gender Differences in Smoking Behaviors (N=96)

Smoking Behavior§	Total N=96 (100%)	Females N=53 (55.2%)	Males N=43 (44.8%)	p-value
Age started smoking**				0.02
15-17	14 (14.6)	5 (9.4)	9 (20.9)	
18-20	38 (39.6)	17 (32.1)	21 (48.8)	
Above 20	44 (45.8)	31 (58.5)	13 (30.2)	
Currently smoke everyday**				0.73
Every day	86 (90.5)	48 (90.6)	38 (88.4)	
Some days	9 (9.5)	5 (9.4)	5 (11.6)	
Use water-pipe**	55 (57.9)	38 (73.1)	17 (39.5)	0.001
Smoking compared to previous year**				0.071
More now	15 (15.6)	10 (18.9)	5 (11.6)	
About the same	57 (59.4)	26 (49.1)	31 (72.1)	
Less now	24 (25.0)	17 (32.1)	7 (16.3)	
Ever thought about quitting smoking** (Yes)	28 (29.5)	17 (32.7)	11 (25.6)	0.45
Made a serious attempt to stop smoking** (Yes)	25 (28.4)	15 (30.0)	10 (26.3)	0.70
Father ever smoked cigarettes** (Yes)	81 (84.4)	46 (86.8)	35 (81.4)	0.47
Mother ever smoked cigarettes** (Yes)	30 (31.3)	17 (32.1)	13 (30.2)	0.85
Reasons why people smoke**				0.69
Stress	24 (25.3)	13 (25.0)	11 (25.6)	
Prestige	0 (0.0)	0 (0.0)	0 (0.0)	
Pleasure	56 (58.9)	32 (61.5)	24 (55.8)	
Social acceptance	14 (14.6)	7 (13.5)	7 (16.3)	
Habit	1 (1.1)	0 (0.0)	1 (1.1)	
Reasons for wanting to quit or cut down on smoking**				
Having my doctor tells me to stop or cut down	72 (75.0)	44 (83.0)	28 (65.1)	0.04
The effect of smoking on my health	51 (53.1)	29 (54.7)	22 (51.2)	0.73
Scientific reports on the dangers of smoking	18 (18.8)	11 (20.8)	7 (16.3)	0.58
The cost of cigarettes	6 (6.3)	1 (1.9)	5 (11.6)	0.10
	Mean ± SD	Mean ± SD	Mean ± SD	
Desire to quit smoking on a scale of 1 to 10*	4.55 ± 2.11	5.34 ± 1.98	3.58 ± 1.95	0.00
Number of serious attempts to quit smoking in the last 2 years*	0.28 ± 0.77	0.43 ± 0.99	0.12 ± 0.33	0.05
Months stayed off tobacco smoking the last time*	9.51 ± 12.37	13 ± 13.46	5.47 ± 9.83	0.05
Confidence in not smoking 1 year from now on scale of 1 to 10*	3.93 ± 2.03	4.5 ± 1.93	3.2 ± 1.95	0.001

§Numbers (N) may not sum to total due to missing data
*t-test
**Chi-Square

Health beliefs. Participants scored moderately high on perceived susceptibility to cancer (24.58±3.32) and perceived severity of cancer (30.31±2.65), but moderately low on the perceived benefits of quitting smoking (35.96±9.74). As for perceived barriers to quit smoking,

participants scored low on addiction barriers (13.91±5.50) and external barriers (8.85±4.14), and moderately low on internal barriers (4.94±2.33). There were no gender differences on any of the health belief subscales.

Acculturation. Participants scored moderately high on the Integration-Marginalization subscale (21.23±3.11), and average on the Separation-Assimilation subscale (16.72±9.53) indicating positive integration and assimilation into the mainstream culture. There were no gender differences on any of the subscales.

Desire to quit smoking. The desire to quit smoking was low (4.55±2.11) and significantly lower for males than females (3.58±1.95 versus 5.34±1.98; $p<0.01$). In addition, it was significantly higher among first generation immigrants compared to second generation immigrants (4.88±1.93 versus 3.92±2.35; $p<0.05$). When asked about reasons to quit or cut down on smoking, participants reported their doctor's recommendation as primary reason (75%), followed by effect of smoking on their health (53%), and scientific reports of the dangers of smoking (18.8%).

Table 3. Gender Differences by Acculturation, Health Beliefs, and Nicotine Dependence (N=96)

	Total (N=96) (Mean ± SD)	Females (N=53) (Mean ± SD)	Males (N=43) (Mean ± SD)	p-value
Acculturation* (Mean ± SD)				
Separation_Assimilation	16.72 ± 9.53	17.47 ± 9.45	15.80 ± 9.61	0.93
Integration_Marginalization	21.23 ± 3.11	21.32 ± 3.22	21.12 ± 2.99	0.99
Health Beliefs and Smoking Cessation*				
Perceived Susceptibility	24.58 ± 3.32	24.81 ± 3.36	24.29 ± 3.30	0.45
Perceived Severity	30.31 ± 2.65	30.34 ± 2.61	30.28 ± 2.75	0.73
Perceived Benefits	35.96 ± 9.74	31.28 ± 1.86	31.12 ± 2.67	0.30
Perceived Barriers*				
Addiction Barriers	13.91 ± 5.50	13.04 ± 4.77	14.96 ± 6.18	0.09
External Barriers	8.85 ± 4.14	8.79 ± 4.00	8.93 ± 4.36	0.87
Internal Barriers S	4.94 ± 2.33	4.62 ± 2.19	5.33 ± 2.47	0.14
Nicotine Dependence** N (%)				0.00
Very Low Dependence (0-2)	33 (55.9)	21 (80.8)	12 (36.4)	
Low Dependence (3-4)	6 (10.2)	4 (14.4)	2 (6.1)	
Medium Dependence (5)	6 (10.2)	0 (0.0)	6 (18.2)	
High Dependence (6-7)	14 (23.7)	1 (3.8)	13 (39.4)	

*t-test
**Chi-Square

Correlation analysis

The desire to quit smoking was positively associated with perceived severity of cancer (r=0.42; p<0.05), perceived susceptibility to cancer (r=0.26; p<0.05), perceived benefits of quitting smoking (r=0.34; p<0.01), separation-assimilation (r=0.09; p=0.19), and integration-marginalization (r=0.04; p=0.34). It was negatively associated with addiction barriers (r=-0.24; p<0.05), external barriers (r=-0.06; p=0.27), internal barriers (r=-0.24; p<0.05), and nicotine dependence (r=-0.45; p<0.05). Correlations among the variables are reported in Table 4.

Table 4. Correlation between Desire to Quit Smoking, Acculturation, and Health Beliefs (N=96)

	Desire to Quit Smoking	Perceived Severity	Perceived Benefits	Perceived Susceptibility	Seperation_ Assimilation	Integration_ Marginalization	Addiction Barriers	External Barriers	Internal Barriers	Nicotine Dependence
Desire to Quit Smoking	1									
Perceived Severity	**.425****	1								
Perceived Benefits	**.339****	**.386****	1							
Perceived Susceptibility	**.258***	**.330****	**.471****	1						
Seperation_Assimilation	.091	.048	**-.220***	-.175	1					
Integration_Marginalization	.043	.041	-.079	-.056	**-.457****	1				
Addiction Barriers	**-.238***	**-.458****	**-.418****	.005	.088	**-.317****	1			
External Barriers	-.063	**-.295****	**-.320****	-.038	.172	**-.290****	**.659****	1		
Internal Barriers	**-.239***	**-.459****	**-.502****	-.183	.197	**-.418****	**.821****	**.676****	1	
Nicotine Dependence	**-.451****	-.071	**-.288****	.011	.021	**-.218***	**.266***	.144	**.293****	1

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

Predictors of desire to quit smoking

Multiple regression analyses (Table 5) were used to assess the ability of perceived susceptibility to cancer, perceived severity of cancer, perceived benefits of quitting smoking and barriers to quit smoking, nicotine dependence, acculturation and gender to predict the desire to quit smoking. Using multiple regression, this combination of variables significantly predicted the desire to quit smoking F (10,47)=3.99; $p<0.001$. The total variance explained by the initial model as a whole is 45.9%, with perceived severity of cancer ($p<0.05$), and nicotine dependence ($p<0.05$), contributing to the prediction of the desire to quit smoking.

Using multiple linear regression with backward elimination yielded eight models with the following variables removed respectively, including the full first model: model 2 (integration-marginalization), model 3 (addiction barrier), model 4 (internal barriers), model 5 (external barriers), model 6 (perceived benefits of quitting smoking), model 7 (separation-assimilation), model 8 (perceived susceptibility to cancer).

The final model using backward elimination, consisted of only gender, nicotine dependence, and perceived severity of cancer as predictors for the desire to quit smoking $F(3,54)=12.30$ $p<0.001$. The total variance explained by this final model as a whole is 40.6%, with gender ($p<0.05$), nicotine dependence ($p<0.05$), and perceived severity of cancer ($p<0.01$) significantly contributing to the prediction of the desire to quit smoking. Acculturation did not support the prediction of the desire to quit smoking in our sample.

Table 5. Predictors of Desire to Quit Smoking (N=96)

	Full Model					Final Model after Backwards Elimination				
	Unstandardized B	**SE**	**t-test**	**Beta**	**Sig.**	**Unstandardized B**	**SE**	**t-test**	**Beta**	**Sig.**
Addiction Barrier	-.024	.082	-.292	-.062	.772					
External Barrier	.038	.078	.482	.074	.632					
Internal Barrier	.081	.199	.409	.090	.685					
Seperation_Assimilation	.042	.033	1.283	.191	.206					
Integration_Marginalization	-.015	.091	-.162	-.022	.872					
Perceived Susceptibility	.119	.098	1.210	.187	.232					
Perceived Benefits	.035	.033	1.045	.160	.301					
Perceived Severity	**.241**	**.116**	**2.087**	**.304**	**.042**	**.319**	**.084**	**3.820**	**.402**	**.00**
Gender (Male)	-.862	.570	-1.513	-.204	.137	**-1.093**	**.527**	**-2.074**	**-.259**	**.043**
Nicotine Dependence	**-.268**	**.122**	**-2.196**	**-.305**	**.033**	**-.248**	**.110**	**-2.264**	**-.283**	**.028**

Full Model: R^2: 0.459; $F(10,47)= 3.99$; $p<0.001$
Final Model: R^2: 0.406; $F(3,54)=12.30$; $p<0.001$

Discussion

The purpose of this study was to investigate smoking behaviors, specifically, the desire to quit smoking, among Arab American smokers and their association with acculturation and health beliefs. Previous studies on Arab Americans' smoking behaviors and health beliefs are very limited, underscoring the significance of the current findings. Among a sample of 96 participants, mostly first generation Arab Americans, participants reported smoking every day, on average eight cigarettes, which is a high rate of smoking and somewhat similar to other studies conducted with Arab Americans (Haddad et al., 2012). The rate of cigarettes smoked per day is lower however, than the U.S. average of 13.8 cigarettes for daily smokers reported in 2014 by the Center for Disease Control and Prevention (Jamal, et al., 2015). The sample was mostly well-educated which is representative of the Arab American population in the U.S.; however, it does not reflect the educational achievement of smokers in the U.S. who are usually less educated (King, Dube, & Tyman, 2012).

Acculturation, through assimilation and integration, was positively correlated with desire to quit smoking, meaning that the higher the assimilation and integration of participants into the mainstream society, the higher their desire to quit smoking; however, the correlation was weak and not significant in our sample. In addition, acculturation was not retained in the final predictive model. However, the desire to quit smoking was significantly lower among second generation immigrant Arabs. These contrasting observations support the complexity of understanding acculturation. Acculturation is a multifaceted phenomenon and measured very differently in studies. Only one study conducted with Arabs used the same acculturation scale and reported a positive correlation between assimilation and a negative correlation between integration and nicotine dependence among Arab Americans. (Al Omari, 2009). Our sample had

average scores of assimilation and integration, which can be a possible explanation of the lower desire to quit smoking. Overall, studies with other ethnic minorities show mixed results regarding the associations between acculturation and smoking behaviors, including smoking cessation (An, Cochran, Mays, & McCarthy, 2008; Ma, Tan, Toubbeh, Su, Shive, & Lan, 2004).

Previous research examining relationships between health beliefs and smoking behavior has primarily focused on cessation, and showed mixed results. For example, Warnecke and colleagues (1978) found that perceived susceptibility to cancer predicted smoking cessation, whereas Aho (1979) reported effects of perceived severity of cancer. Mallaghan and Pemberton (1977) found that perceived susceptibility to cancer was significantly related to smoking cessation, yet Croog and Richards (1977) found no relationship between smoking cessation and health beliefs. In our study, the desire to quit smoking was significantly positively correlated with perceived susceptibility to cancer, perceived severity of cancer, and perceived benefits of quitting smoking. On the other hand, and similar to a previous study conducted with Arab Americans (El Shahawy & Haddad, 2015), desire to quit smoking was negatively associated with internal barriers, external and addiction barriers. This can be interpreted as the more the barriers to quit, the less desire a person have to quit.

In the final model, the standardized beta weights suggest that being a male ($ß$=-0.259, p<0.001) and having high nicotine addiction ($ß$=-0.283, p<0.0001) are inversely predictive of desire to quit smoking; whereas higher perception of cancer severity ($ß$=0.402, p<0.001) is predictive of higher desire to quit smoking. According to Cohen (1988), the total variance of 40.6%, explained by the final model, is a large effect. The findings of being female and having lower level of nicotine addiction are predictive of higher desire to quit smoking are similar to other studies (Al Omari & Scheibmeir, 2009; Haddad et al., 2014; Jamil et al., 2009).

Reasons for quitting smoking differed greatly from other studies. In our sample, participants reported the primary reason to quit smoking was their doctor's recommendation; in a previous study, the primary reason to quit smoking was the cost of smoking, and doctor's recommendation was the eighth reason (Haddad et al., 2014). This finding is important when planning future interventions for smoking cessation among Arab Americans. Female participants had more confidence in quitting smoking and reported higher number of attempts to quit smoking than males which is similar to other studies (Al Omari & Scheibmeir, 2009; Jamil et al., 2009). Surprisingly, females reported water-pipe smoking at a significantly higher rate than males, which is different from previous studies conducted in the U.S. (Haddad et al., 2014; Grekin & Ayna, 2012). However, studies conducted in the Arab countries show that the prevalence of water-pipe smoking among Arab women is increasing at higher rates compared to cigarette smoking (Samet & Yoon, 2010). Water-pipe is seen as a form of socialization that seems to be culturally more accepted for women than cigarettes smoking. In addition, as gender norms keep changing in the Arab region, and more prominently among Arabs in the U.S., female smoking of water-pipe is likely to increase (Khalil et al., 2013). This can be an explanation of why women in this study reported higher rates of water-pipe smoking than men. The desire to quit smoking was low, in particular among men. This finding is similar to other studies when the intention to quit cigarettes and/or water-pipe smoking was also low (Athamneh, Sansgiry, Essien, & Abughosh, 2015; Haddad et al., 2014).

Conclusion

The study findings have implications for both researchers and healthcare providers. Participants who were females, perceived cancer as severe (health belief), and had lower nicotine dependence, significantly predicted higher desire to stop smoking. Acculturation did not have a

significant influence in predicting the desire to quit smoking in our sample. Healthcare providers can play an important role in reinforcing the health belief of cancer severity in smoking, in particular among males. They can also address the barriers that Arab Americans smokers face when trying to quit smoking to increase their desire to quit smoking. Additional studies are needed however, to better understand the gender differences and the different factors that can increase the intention and actual behavior to quit smoking. Intervention studies can target cancer severity and nicotine dependence to increase desire for smoking cessation.

Limitations

The findings need to be interpreted in light of several limitations. Because we used self-reported data, social desirability bias is a limitation. Social desirability bias occurs when participants taking a survey tend to answer the questions in a way that is viewed favorably by others, either by reporting "good behavior" or not reporting "undesirable behavior." Through the use of convenience samples, participants more readily accessible to the researcher were more likely to be included. Thus, opportunity to participate is not equal for all individuals in the target population and study results are not necessarily generalizable to this population. Other limitations can be attributed to the cross-sectional nature of the design thus limiting inference to associations.

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Chapter IV

Smoking Behavior in Arab Americans: Acculturation and Health Beliefs

Discussion

The reviewed studies in the first manuscript, the systematic review of the literature, showed that smoking, both cigarettes and water pipe, is highly prevalent among Arab Americans. Investigating the acculturation process among immigrants has been an increasingly important topic in multicultural research and in understanding the health outcomes of the immigrant populations in the U.S. Ethnic minority immigrants are vulnerable to a range of health disparities, such as high rates of smoking, obesity, and low rates of yearly regular checkups, which can negatively affect their health outcomes in the long-term. These disparities are related to several intersecting factors including acculturation and cultural and religious factors.

Despite the increasing numbers of Arab Americans in the U.S. and their high rate of smoking prevalence, findings of the systematic review conducted reveal that limited research has been conducted on smoking behavior in Arab Americans. Of the studies that exist, the majority focused on smoking prevalence, smoking cessation, acculturation, and health beliefs in Arab Americans adolescents. To date, only two smoking cessation programs have been developed for Arab Americans, despite the high prevalence of both cigarette and water-pipe smoking in this community. The review also demonstrated that there have been no studies conducted in the U.S. investigating the relationship between acculturation, smoking behavior, and cancer in Arab Americans.

In the second manuscript, the purpose of the study conducted was to investigate smoking behaviors, specifically, the desire to quit smoking, among Arab American smokers and their association with acculturation and health beliefs. Previous studies on Arab Americans' smoking

behaviors and health beliefs are very limited, underscoring the significance of the current findings. Among a sample of 96 participants, mostly first generation Arab Americans, participants reported smoking every day, on average eight cigarettes. Acculturation, through assimilation and integration, was positively correlated with desire to quit smoking, meaning that the higher the assimilation and integration of participants into the mainstream society, the higher their desire to quit smoking; however, the correlation was weak and not significant in our sample. In addition, acculturation was not retained in the final predictive model. However, the desire to quit smoking was significantly lower among second generation immigrant Arabs. These contrasting observations support the complexity of understanding acculturation.

Previous research examining relationships between health beliefs and smoking behavior has primarily focused on cessation, and showed mixed results. In our study, the desire to quit smoking was significantly positively correlated with perceived susceptibility to cancer, perceived severity of cancer, and perceived benefits of quitting smoking. On the other hand, desire to quit smoking was negatively associated with internal barriers, external and addiction barriers. This can be interpreted as the more the barriers to quit, the less desire a person have to quit. Our final model, the standardized beta weights suggest that being a male ($ß$=-0.259, p<0.001) and having high nicotine addiction ($ß$=-0.283, p<0.0001) are inversely predictive of desire to quit smoking; whereas higher perception of cancer severity ($ß$=0.402, p<0.001) is predictive of higher desire to quit smoking.

Reasons for quitting smoking differed greatly from other studies. In our sample, participants reported the primary reason to quit smoking was their doctor's recommendation. This finding is important when planning future interventions for smoking cessation among Arab Americans. Female participants had more confidence in quitting smoking and reported higher

number of attempts to quit smoking than males and surprisingly, females reported water-pipe smoking at a significantly higher rate than males. The desire to quit smoking was low, in particular among men.

Conclusions

Evidence clearly exists that establishes a connection between high smoking rates and health disparities. To our knowledge we are the first to review Arab American smoking behavior. The systematic review provides a description of Arab Americans' smoking behavior, specifically focusing on the relationship between this behavior and the acculturation level and health beliefs in this population. Findings demonstrated the scarcity of research on smoking in Arab Americans. This knowledge gap has impeded the development of interventions that aim to improve health outcomes and reduce health disparities in this vulnerable, ethnic minority population. Given the rapid increase of Arab American residents in the U.S., more research about the smoking beliefs, behaviors, and cessation attempts of this population is warranted.

Implications

This paper signifies the need for future research focusing on determining the health beliefs and sociocultural factors that influence smoking prevalence in Arab Americans, and the effect of acculturation on smoking rates over time in order to develop culturally appropriate smoking cessation interventions for this population. In addition, future research needs to address the limitations of present studies by including female participants, expanding recruitment strategies, examining a broader range of geographical areas, and conducting additional research on water-pipe smoking. In this way, researchers in health promotion can develop interventions to reduce the high rates of smoking among Arab Americans as well as prevent diseases such as

cancer, stroke, heart disease, and diabetes in both primary smokers and their family members, who are exposed to second hand smoke.

The study findings have implications for both researchers and healthcare providers. Participants who were females, perceived cancer as severe (health belief), and had lower nicotine dependence, significantly predicted higher desire to stop smoking. Acculturation did not have a significant influence in predicting the desire to quit smoking in our sample. Healthcare providers can play an important role in reinforcing the health belief of cancer severity in smoking, in particular among males. They can also address the barriers that Arab Americans smokers face when trying to quit smoking to increase their desire to quit smoking. Additional studies are needed however, to better understand the gender differences and the different factors that can increase the intention and actual behavior to quit smoking. Intervention studies can target cancer severity and nicotine dependence to increase desire for smoking cessation. Health Belief Model could be the theory of choice in developing new interventions for smoking cessation especially in Arab Americans based on the constructs that were significant in the study conducted which was the perceived severity of cancer in specific.

Limitations

The findings need to be interpreted in light of several limitations. Because we used self-reported data, social desirability bias is a limitation. Social desirability bias occurs when participants taking a survey tend to answer the questions in a way that is viewed favorably by others, either by reporting "good behavior" or not reporting "undesirable behavior." Certain limitations can be related to sample and sample size, through the use of convenience samples, participants more readily accessible to the researcher were more likely to be included. Thus, opportunity to participate is not equal for all individuals in the target population and study results

are not necessarily generalizable to this population. Other limitations can be attributed to the cross-sectional nature of the design thus limiting inference to associations.

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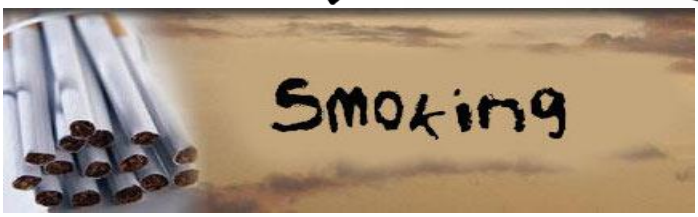
Appendix A

Study Flier

The Arab American Smoking Behavior Study



Are you or your parents of an Arab origin?

Is your age 18 years or more?

Do you smoke?

Do you read/write/speak English?

If so, you may be eligible to take part in a voluntary research study exploring the smoking behavior in Arab Americans; its relationship to acculturation and heath beleifs!

For more information or to enroll in the study, please contact Roula Ghadban: 716-541-5144 or email: ghadbanr@vcu.edu

Your participation is greatly needed and appreciated!

Arab American: **716-541-5144** **ghadbanr@vcu.edu**
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Arab American: **716-541-5144** **ghadbanr@vcu.edu**
Arab American: **716-541-5144** **ghadbanr@vcu.edu**

Appendix B

Screening Protocol

If the participant is interested in the study and willing to proceed and participate, the following screening questions will be asked:

1. Do you identify as Arab or from an Arab ancestry? (If yes, proceed; if no, thank the participant and apologize for not being eligible to participate)

2. Are you older than 18 years? (If yes, proceed; if no, thank the participant and apologize for not being eligible to participate)

3. Do you speak/read/write English?
    1. Yes
    2. No (Thank the participant and apologize for not being eligible to participate)

4. Are you currently a smoker:
    1. Yes
    2. No (If yes, proceed; if no, thank the participant and apologize for not being eligible to participate)

5. Are you willing to provide personal information related to smoking attitudes and behaviors (all information is totally anonymous and confidential)? (If yes, proceed; if no, thank the participant and apologize for not being eligible to participate)

6. Are you willing to participate in the study? (If no, thank the participant for calling).

7. How would you like to fill the survey?
    a. A paper-and-pencil copy at a location of your choice
    b. A paper-and-pencil copy mailed to the participant's address

RESEARCH SUBJECT INFORMATION AND CONSENT FORM

Appendix C

Informed Consent

TITLE: Smoking Behavior in Arab Americans: Acculturation and Health Beliefs

VCU IRB NO.:

If any information contained in this consent form is not clear, please ask the study staff to explain any information that you do not fully understand. You may take home an unsigned copy of this consent form to think about or discuss with family or friends before making your decision.

PURPOSE OF THE STUDY
The purpose of this study is to investigate smoking behaviors among Arab Americans and the association between smoking behaviors, acculturation, and health beliefs. This study will examine the variation in smoking behaviors among Arab Americans as explained by acculturation level, perceived susceptibility to and perceived severity of cancer, and perceived barriers and perceived benefits of smoking cessation.

You are being asked to participate in this study because you are a smoker, of age of 18 or older, and you identify yourself as first, second or third generation Arab or Arab Americans.

DESCRIPTION OF THE STUDY AND YOUR INVOLVEMENT

If you decide to be in this research study, you will be asked to sign this consent form after you have had all your questions answered and understand what will happen to you

In this study you will be asked to complete survey composed of questions addressing issues related to smoking behavior, smoking cessation, acculturation, and health beliefs. Your response to these questions should take between *25-30 minutes* to complete.

RISKS AND DISCOMFORTS
A potential risk is the psychological impact secondary to sharing personal information about smoking behaviors, acculturation, and health beliefs. You can stop completing the survey anytime you feel any discomfort related to the questions.

USE AND DISCLOSURE OF PROTECTED HEALTH INFORMATION
Authority to Request Protected Health Information
The following people and/or groups may request my Protected Health Information:

- Principal Investigator and Research Staff
- Research Collaborators
- Data Safety Monitoring Boards
- Study Sponsor
- Institutional Review Boards
- Government/Health Agencies

- Others as Required by Law

Authority to Release Protected Health Information

The VCU Health System (VCUHS) may release the information identified in this authorization from my medical records and provide this information to:

- Health Care Providers at the VCUHS
- Study Sponsor
- Data Coordinators
- Data Safety Monitoring Boards
- Others as Required by Law
- Principal Investigator and Research Staff
- Research Collaborators
- Institutional Review Boards
- Government/Health Agencies

Once your health information has been disclosed to anyone outside of this study, the information may no longer be protected under this authorization.

Type of Information that may be released

The following types of information may be used for the conduct of this research:

☐ Complete health record
☐ Diagnosis & treatment codes
☐ Discharge summary
☐ History and physical exam
☐ Consultation reports
☐ Progress notes
☐ Laboratory test results
☐ X-ray reports
☐ X-ray films / images
☐ Photographs, videotapes
☐ Complete billing record
☐ Itemized bill
☐ Information about drug or alcohol abuse
☐ Information about Hepatitis B or C tests
☐ Information about psychiatric care
☐ Information about sexually transmitted diseases
☒ Other (specify): Medical history

Expiration of This Authorization

☒ This authorization will expire when the research study is closed, or there is no need to review, analyze and consider the data generated by the research project, whichever is later.
☐ This research study involves the use of a Data or Tissue Repository (bank) and will never expire.
☐ Other (specify):

Right to Revoke Authorization and Re-disclosure

You may change your mind and revoke (take back) the right to use your protected health information at any time. Even if you revoke this Authorization, the researchers may still use or disclose health information they have already collected about you for this study. If you revoke this Authorization you may no longer be allowed to participate in the research study. To revoke this Authorization, you must write to the Principal Investigator.

BENEFITS TO YOU AND OTHERS

You may not get any direct benefit from this study, but, the information we learn from people in this study may help us understand the impact of acculturation and health beliefs on smoking behaviors and smoking cessation among Arab Americans, and to design culturally-relevant smoking cessation interventions for Arab Americans.

COSTS

There are no costs for participating in this study other than the time you will spend in filling out questionnaires.

CONFIDENTIALITY

Potentially identifiable information about you will consist of *surveys.* Data is being collected only for research purposes. All identifiable paper copies of consent forms, demographic data, and paper-and-pencil questionnaires will be kept in a locked cabinet. Data will be de-identified, cleaned, and double-entered into a statistical software database (SPSS) that will be used for all the analyses, and stored on a secure research server. In addition, all study documents will be maintained on a secure server and a password-protected and encrypted drive. Survey data will be treated confidentially with no identifying information shared or presented in any report. Data will not be shared with or accessed by third parties. Your data (surveys) will be identified by ID numbers, not names, and stored separately from research data in a locked research area. Study data and records will be kept in a locked file cabinet for one year after the study ends and will be destroyed at that time. Access to all data will be limited to study personnel. A data and safety monitoring plan is established.

We will not tell anyone the answers you give us; however, personal information about you might be shared with or copied by authorized officials of the Department of Health and Human Services or other federal regulatory bodies.

If, as part of this research, we learn about real or suspected child or elder abuse, the law says that we have to let people in authority know so they can protect the person(s) at risk.

If something we learn through this research indicates that you may intend to harm yourself or others, we are obligated to report that to the appropriate authorities.

What we find from this study may be presented at meetings or published in papers, but your name will not ever be used in these presentations or papers.

VOLUNTARY PARTICIPATION AND WITHDRAWAL

You do not have to participate in this study. If you choose to participate, you may stop at any time without any penalty. You may also choose not to answer particular questions that are asked in the study.

Your participation in this study may be stopped at any time by the study staff without your consent. The reasons might include:

- the study staff thinks it necessary for your health or safety;

- you have not followed study instructions;
- the sponsor has stopped the study; or
- administrative reasons require your withdrawal.

If you leave the study before the final regularly scheduled visit, *[Insert any consequences of a subject's decision to withdraw from the research (i.e., psychological risks or discomforts) and procedures for orderly termination of participation by the subject (i.e., follow-up visits with study team).*]

QUESTIONS

If you have any questions, complaints, or concerns about your participation in this research, contact:

PI: Jeanne Salyer. PhD, RN, FNAP
Associate Professor, Adult Health & Nursing Systems
VCU School of Nursing
1100 East Leigh Street
Richmond, VA 23298
Office: School of Nursing Building, room 3037
Phone: 804-828-3373

PhD student: Roula Ghadban
Phone: 716-541-5144

The researcher/study staff named above is the best person(s) to call for questions about your participation in this study.

If you have any general questions about your rights as a participant in this or any other research, you may contact:

Office of Research

Virginia Commonwealth University

800 East Leigh Street, Suite 3000

P.O. Box 980568

Richmond, VA 23298

Telephone: (804) 827-2157

Contact this number to ask general questions, to obtain information or offer input, and to express concerns or complaints about research. You may also call this number if you cannot reach the research team or if you wish to talk with someone else. General information about participation in research studies can also be found at http://www.research.vcu.edu/irb/volunteers.htm.

CONSENT

I have been given the chance to read this consent form. I understand the information about this study. Questions that I wanted to ask about the study have been answered. My signature says that I am willing to participate in this study. I will receive a copy of the consent form once I have agreed to participate.

Participant name printed	Participant signature	Date

_____

Name of Person Conducting Informed Consent Discussion / Witness [3]

(Printed)

_____ _____

Signature of Person Conducting Informed Consent Discussion / Witness — Date

_____ _____

Principal Investigator Signature (if different from above) — Date [4]

Appendix D

Questionnaire

Thank you for participating in the study. Remember that all the information is confidential and anonymous. Please try to answer as honestly as possible.

1. How old are you? _____ years

2. Gender
   1) Female
   2) Male

3. What is your current marital status?
   1) Single
   2) Married
   3) Living with a partner
   4) Separated
   5) Divorced
   6) Widowed

4. In what country were you born? _____

5. What generation best describes you
   1) Born in Arab country and migrated to USA
   2) Born in the USA AND either parents born outside of the USA
   3) Born in the USA AND parents born in USA

6. How many years have you been living in the United States? _____ years ___ months

7. Ethnicity (check all that apply)
   1) Arab
   2) Arab American
   3) Other (please specify):

8. What language do you speak at home?
   1) Only Arabic
   2) Mostly Arabic
   3) Arabic and English both equally
   4) Mostly English
   5) Only English
   6) Other (please specify):

9. What is the highest grade or level of school that you have completed?

1) Middle School
2) High school graduate
3) Some college or 2-year degree
4) 4-year college graduate
5) More than 4-year college degree
6) Refused to answer

10. Are you
    1) Working fulltime for pay
    2) Working part time for pay
    3) Unemployed and looking for work
    4) Temporarily laid off or on leave
    5) Disabled/Unable to work
    6) Retired
    7) Student
    8) Others (please specify):

11. What is your annual income?
    1) Less than $25,000/year
    2) Between $25,000 and $50,000/year
    3) Between $50,000 and $75,000/year
    4) Between $75,000 and $100,000/year
    5) More than $100,000/year

12. Do you have a family history of
    1) Hypertension
    2) Diabetes
    3) Cardiac Problems
    4) Cancer
    5) Others (please specify):

13. Are you diagnosed with
    1) Hypertension
    2) Diabetes
    3) Cardiac Problems
    4) Cancer
    5) Others (please specify):

14. Have you ever been diagnosed with cancer?
    1) Yes
        i. If yes please specify what type: _____
    2) No

The following section asks questions about the process of adapting to different cultures. Please rate how much you agree or disagree with the following statements (please choose one answer):

There are no right answers to the following information. We are simply interested in your opinion.

1. I would much prefer to live in an Arab country

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
☐	☐	☐	☐	☐	☐	☐

2. Most of my friends are Arabs

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
☐	☐	☐	☐	☐	☐	☐

3. I behave like an American in many ways

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
☐	☐	☐	☐	☐	☐	☐

4. Generally I feel more comfortable around Americans than I do around Arabs

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
☐	☐	☐	☐	☐	☐	☐

5. I mix equally well with Americans and Arabs

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
☐	☐	☐	☐	☐	☐	☐

6. I am equally at ease socializing with Arabs and Americans

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
☐	☐	☐	☐	☐	☐	☐

7. I have a lot of difficulty making friends

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
☐	☐	☐	☐	☐	☐	☐

8. I have many Arab and American friends

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
☐	☐	☐	☐	☐	☐	☐

The following sections ask questions related to smoking behaviors. Please read each statement carefully and check the answer that best states your opinion.

1. Do you currently smoke tobacco?
    1) Yes (Answer the rest of the questionnaire)
    2) No (Stop answering this questionnaire)

2. At what age did you start smoking?
    1) Below 15
    2) 15-17
    3) 18-20
    4) Above 20

3. Have you smoked at least 100 cigarettes or the equivalent in your lifetime?
    1) Yes
    2) No → Skip items 12-23
    3) Don't know
    4) Prefer not to answer

4. Do you currently smoke every day, some days or not at all? (We would like you to include cigarettes, cigars, cigarillos or waterpipe)
    1) Every day
    2) Some days
    3) Not at all
    4) Prefer not to answer

5. In the last 30 days, did you smoke every day, some days or not at all?
    1) Every day
    2) Some days
    3) Not at all
    4) Prefer not to answer

6. On an average day, about how many cigarettes a day do you currently smoke? (By cigarette, we would like you to include cigarettes, cigars, cigarillos or waterpipe)
    1) Please specify:
    2) Don't know
    3) Prefer not to answer

7. Do you currently use?
    I. Smokeless tobacco products?
    1) Yes → How many times per day or week, on average? _____days/week
    2) No

II. Roll-your-own cigarettes?
1) Yes → How many times per day or week, on average? _____days/week
2) No

III. Flavored cigarettes?
1) Yes → How many times per day or week, on average? _____days/week
2) No

IV. Flavored little cigars?
1) Yes → How many times per day or week, on average? _____days/week
2) No

V. A hookah or a waterpipe to smoke tobacco?
1) Yes → How many times per day or week, on average? _____days/week
2) No

VI. Dissolvable tobacco products?
1) Yes → How many times per day or week, on average? _____days/week
2) No

VII. Electronic cigarettes or E-cigarettes?
1) Yes → How many times per day or week, on average? _____days/week
2) No

VIII. Some other tobacco products not listed here?
1) Yes → How many times per day or week, on average? _____days/week
2) No

8. The last time you bought cigarettes for yourself, how many cigarettes did you buy?
I. Number: _____

II. Unit (please specify):
1) Cigarettes
2) Packs
3) Carton
4) Other:
5) Never bought cigarettes
6) Don't know
7) Prefer not to answer

9. Compared to last year, how much do you smoke now?
1) More now
2) About the same
3) Less now

10. Have you ever thought about quitting smoking?
    1) Yes
    2) No (Go to question 12)

11. Have you made a serious attempt to stop smoking?
    1) Yes
    2) No (Go to question 17)

12. How long did you actually stay off tobacco smoking the last time (indicate number)? (Please one answer only).
    1) Days: _____
    2) Weeks:_____
    3) Months:_____
    4) Years:_____

13. How often do you smoke while at work or at school?
    1) Frequently
    2) Occasionally
    3) Seldom
    4) Never

14. Do you refrain from smoking in places where there is "no smoking" sign?
    1) Yes
    2) No

15. Smoking is harmful to health:
    1) Strongly agree
    2) Mildly agree
    3) Mildly disagree
    4) Strongly disagree
    5) No opinion/ Do not know

16. Are you concerned about the harmful effect smoking may have on your health?
    1) Very concerned
    2) Fairly concerned
    3) Slightly concerned
    4) Not concerned

17. What do you believe makes people smoke?
    1) Stress
    2) Prestige
    3) Pleasure
    4) Social acceptance
    5) Other (please specify):

18. If you know about the health hazards of smoking, from what sources did you get such information?
    1) School
    2) Doctor
    3) Media (newspapers, television, radio, social media)
    4) Other (please specify): _____

19. At what age did you smoke a cigarette at least once a week? _____

20. How many cigarettes have you smoked in the last 7 days? _____

21. How many times have you quit smoking? _____

22. How many times have you made a serious attempted to quit smoking in the last 2 years? _____

23. What was the longest period of time that you stayed off cigarettes?
    1) Never
    2) Less than 2 weeks
    3) 2 to 6 weeks
    4) 7 to 12 weeks
    5) 3 to 11 months
    6) 1 to 2 years
    7) Over 2 years

24. Now thinking of your entire smoking history, have you ever switched from one type of cigarette to another just to reduce the amount of tar and nicotine?
    1) Yes
    2) No

    If yes, why? (Check all that apply)
    1) Concern for health
    2) Thought it would help me quit smoking
    3) Other (please specify): _____

25. When you were growing up, did your father ever smoke cigarettes regularly?
    1. Yes
    2. No
    3. Don't know

26. Did your mother ever smoke cigarettes regularly?
    1. Yes
    2. No
    3. Don't know

27. If you have ever tried to stop smoking, was the last time:

1. Very difficult
2. Easy
3. Difficult
4. Never tried

28. Do you find it difficult to keep from smoking in places where it is not allowed?
    1. Yes
    2. No

29. How much do you want to quit smoking on a scale of 1 to 10?

Not at all									Very much
1	2	3	4	5	6	7	8	9	10

30. How confident are you that you will not be smoking 1 year from now on a scale of 1 to 10?

Not at all									Very much
1	2	3	4	5	6	7	8	9	10

31. Which of the following seem to be your reasons for wanting to quit or cut down your smoking? (Check as many as apply)
    1) The cost of cigarettes
    2) To improve my sense of taste or smell
    3) The messiness or dirtiness of the habit
    4) The effect of smoking on my health
    5) Having my doctor tells me to stop or cut down
    6) Scientific reports on the dangers of smoking
    7) Being a bad example on the dangers of smoking
    8) Having spouse or family members want me to sop or cut down
    9) Not really enjoying smoking
    10) Other (specify):
    11) I don't want to quit or cut down

32. How soon after you wake up do you have your first cigarette?
    1. Within 5 minutes
    2. 6-30 minutes
    3. 31-60 minutes
    4. After 60 minutes

33. Do you smoke more frequently during the first hours after waking than during the rest of the day?
    1. Yes
    2. No

34. Do you find it difficult to refrain from smoking in places where it is forbidden, e.g., in church, the library, and the cinema, etc.?
    1. Yes
    2. No

35. Which cigarette would you hate most to give up?
    1. The first one in the morning
    2. All others

36. How many cigarettes/day do you smoke each day?
    1. 10 or fewer
    2. 11-20
    3. 21-30
    4. 31 or more

37. Do you smoke even if you are so ill that you are in bed most of the day?
    1. Yes
    2. No

The following section asks questions related to attitudes toward health including cancer. Please choose one response:

1. In comparison to most other people, how susceptible would you say you are to illness in general?

Much less Susceptible	Somewhat Less Susceptible	Equally Susceptible	Somewhat more Susceptible	Much More Susceptible
☐	☐	☐	☐	☐

2. In comparison to most other people, how susceptible do you think you are to developing a serious heart condition?

Much less Susceptible	Somewhat Less Susceptible	Equally Susceptible	Somewhat more Susceptible	Much More Susceptible
☐	☐	☐	☐	☐

3. In comparison to most other people, how susceptible do you think you are to developing cancer?

Much less Susceptible	Somewhat Less Susceptible	Equally Susceptible	Somewhat more Susceptible	Much More Susceptible
☐	☐	☐	☐	☐

4. I see illness as an important threat to my life. Do you?

Strongly Disagree	Disagree	Neutral	Agree	Agree Strongly
☐	☐	☐	☐	☐

5. The chance of having a serious medical problem is greater for a smoker than for a nonsmoker. Do you?

Strongly Disagree	Disagree	Neutral	Agree	Agree Strongly
☐	☐	☐	☐	☐

6. The chance of getting cancer in general is greater for a smoker than for a nonsmoker. Do you?

Strongly Disagree	Disagree	Neutral	Agree	Agree Strongly
☐	☐	☐	☐	☐

7. The chance of getting lung cancer in specific is greater for a smoker than for a nonsmoker. Do you?

Strongly Disagree	Disagree	Neutral	Agree	Agree Strongly
☐	☐	☐	☐	☐

8. If you already have cancer and your conditions were to get worse. How serious do you think it would be?

Not at all Serious	Slightly Serious	Fairly Serious	Very Serious	Extremely Serious
☐	☐	☐	☐	☐

9. Cancer is a severe medical condition. Do you?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

10. Some people are able to make a complete recovery from a cancer. Do you?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

11. If you have a recurrence of an already existing cancer. What do you think the intensity of episode of illness would be?

Very Strong	Somewhat Strong	Uncertain	Not Strong	Not Strong at all
☐	☐	☐	☐	☐

12. Cancer would disrupt a person's life. Do you?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

13. There are many other diseases that people can get that are more serious than cancer. Do you?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

14. Cancer does NOT necessarily have to interfere with a person's capacity to live a normal life. Do you?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

15. Once a person develops cancer, there is not much he/she can do to alter the course of that condition. Do you?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

16. How likely do you feel it is that one can eventually get treated from cancer completely?

Very Unlikely	Fairly Unlikely	Equally Likely and Unlikely	Fairly Likely	Very Likely
☐	☐	☐	☐	☐

The following section asks questions about your attitudes towards smoking cessation and cancer in general. Please choose one answer:

17. How beneficial do you think quitting smoking is in dealing with cancer?

Not at all Beneficial	Slightly Beneficial	Fairly Beneficial	Very Beneficial	Extremely Beneficial
☐	☐	☐	☐	☐

18. How helpful do you think quitting smoking is in preventing cancer?

Not at all Helpful	Slightly Helpful	Fairly Helpful	Very Helpful	Extremely Helpful
☐	☐	☐	☐	☐

19. Quitting smoking increases the chances of recovering from cancer. Do you?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

☐	☐	☐	☐	☐

20. Quitting smoking is not an effective treatment for cancer. Do you?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

21. How helpful do you think **quitting smoking** is in doing each of the following with regard to cancer and health in general? Please answer to the best of your knowledge even **if you don't have cancer.**

	Extremely Helpful	Not at all Helpful	Slightly Helpful	Fairly Helpful	Very Helpful
1. Relieving symptoms of cancer					
2. Preventing death from cancer					
3. Preventing reoccurrence of cancer					
4. Improving quality of life					
5. Improving one's sense of smell and taste					
6. Improving one's self-esteem					
7. Improving one's general health					
8. Improving one's social life					
9. Improving one's finances					

The following section asks questions about things you consider to be barriers to stopping tobacco use. Barriers are difficulties or feelings that make it harder for you to stop smoking. Please think about what <u>has, might, or is now</u> making it difficult for you to stop tobacco use.

	Not applicable	Small barrier	Medium barrier	Large barrier
1. Gaining weight				
2. No encouragement or help from friends				
3. Having strong feelings such as anger, or being upset when you are by yourself				
4. Having withdrawal symptoms				
5. Feeling less in control of your moods				
6. Family members or significant others are encouraging you to smoke				
7. Missing the companionship of cigarettes				
8. No encouragement or help from family members or significant others				
9. Having strong feelings such as anger, or being upset when you are with other people				
10. Thinking about never being able to smoke again				
11. Friends encouraging you to smoke				
12. Thinking about cigarettes all the time				
13. Not knowing for how long it will be very hard not to use tobacco				
14. No encouragement at work for not smoking				
15. Being addicted to tobacco				

16. Fear of failing to quit				
17. Lack of understanding from family and significant others about what it is like to quit				
18. Seeing things or people which remind you of tobacco				
19. Feeling lost without tobacco				

Thank you again for your participation! ☺

Curriculum Vita

ROULA GHADBAN, PhD, MSN, RN
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Education and Training

Doctoral/ Graduate:	
2017	PhD (Nursing), Virginia Commonwealth University (VCU), Richmond, VA
2006	Masters of Science in Nursing, Concentration in Nursing Administration, American University of Beirut (AUB), Beirut, Lebanon
Undergraduate:	
1999	Bachelor of Science in Nursing, American University of Beirut (New York State Accredited), Beirut, Lebanon

Research Interests

Acculturation
Arab Americans
Smoking
Cancer

Professional Experience

Teaching Experience

Jan 2016-Present	Clinical Instructor	UF, Gainesville, FL
Oct 2005-June 2006	Teaching Assistant/ Clinical Instructor	AUB, Beirut, Lebanon

Research Experience

Jan 2014-Present	Research Consultant	UF, Gainesville, FL
Jan 2013-August 2015	Research Assistant	VCU, Richmond, VA

June 2005- June 2007	Research Assistant Department, Lebanon	AUB, Oncology Beirut,
Sep 2003- May 2004	Research Assistant	AUB, Beirut, Lebanon

Nursing and Nursing Administration Experience

June 2008- June2012 Fillmore	Clinical Care Coordinator/ Registered Nurse	Millard
	Medical Surgical Telemetry Specialty Unit	Gates Circle Hospital- Kaleida Health, Buffalo, NY, USA
Oct 2005- June 2006	Nursing Administration Resident	AUB Medical Center Nursing Department (ANCC Accredited) Beirut, Lebanon
Aug 1999- Jan 2005	Registered Nurse Medical Surgical/ Oncology Magnet Hospital) Beirut, Lebanon	AUB Medical Center (JCI Accredited and

Other Experience

July 2008- Nov 2009 International	Over the phone interpreter	Cyracom
	Arabic-English	Tuscan, Arizona,USA
June 2005- June 2007	Medical Sales Representative	Levant Alie House (Agent of ABOTT) Beirut, Lebanon
Nov 2005- June 2007	SAT I Assistant Supervisor	AMIDEAST, Beirut, Lebanon

Publications

- Alzyoud, S., Haddad, L., El Shahawy, O., **Ghadban, R.,** Kheirallah, K., Alhawamdeh, K. A., & Jin, Y. (2014). Patterns of water-pipe use among Arab

immigrants in the USA: A pilot study. *British Journal of Medicine and Medical Research, 4*(3), 816-827.

- Haddad, L., El-Shahawy, O., & **Ghadban, R.** (2014). Comparison of barriers to cessation among Arab American smokers of cigarettes and Waterpipe. *International Journal of Environmental Research and Public Health, 11*, 9522-9531. doi:10.3390/ijerph110909522
- Haddad, L., El-Shahawy, O., **Ghadban, R.,** Barnett, T. E., & Johnson, E. (2015). Water-pipe smoking and regulation in the United States: A comprehensive review of the literature. *International Journal of Environmental Research and Public Health, 12*(6), 6115-6135.
- **Ghadban, R.,** Haddad, L., An, K., Thacker, L. R., & Salyer, J. (2016). Smoking behavior in Arab Americans: A systematic review. *Journal of Community Medicine & Health Education, 6*(64), 1-16. doi:10.4172/2161-0711.100046
- Haddad, L, Kelly, D. L., Weglicki, L. S., Barnette, T. E., Farrell, A., & **Ghadban, R.** (2016). A systematic review of effects of waterpipe smoking on cardiovascular and respiratory health outcomes. *Tobacco Use Insights, 9*, 13-28. doi:10.4137/TUI.S39873
- Haddad, L., Bakai, J., **Ghadban, R,** & Ferrell, A. (2016). Smoking-related attitudes, behaviors and cessation efforts among coronary artery disease patients in Hungary. *Journal of Community Medicine & Health Education, 6*(6), 1-5. doi:10.4172/2161-0711.1000485
- Haddad, L., Ferrell, A., Salloum, R. G., Weglicki, L. & **Ghadban, R.** (Under review). Regulation, marketing, and distribution of electronic nicotine delivery systems (ENDS): A systematic review

Posters and Presentations

- 2017 APHA: Abstract: Smoking Behaviors in Arab Americans: Acculturation and Health Beliefs (Submitted)
- 2014 SNRT: Culturally Tailored Smoking Cessation for Arab American Male Smokers in a Community Setting
- 2014 SNRT: Nicotine dependence and barriers to cessation differences between exclusive cigarette smokers and dual (water-pipe) smokers among Arab Americans
- 2013 SNRT: Trends in Water Pipe Use Among Arab Americans in Richmond Metropolitan Area
- 2013 SNRT: Secondhand Smoke Exposure of Young Adults in a Developing Country- A Jordanian Case

Professional Memberships and Committees

- 2013- Present Member of the American Public Health Association
- 2013- Present Member of the Sigma Theta Tau International Honor Society of Nursing
- 2013 PhD Student Member of tenure review committee at VCU
- 1999- Present Member of the AUB Alumni Association

- 2004- 2007 Active Cabinet Member of the AUB Alumni- Nursing Chapter
- 2004- 2005 Magnet Champion at AUB-MC Oncology Unit
- 2003- 2005 Chairperson of the Social Committee at AUB-MC
- 2001- 2002 Member of the Social Committee at AUB-MC
- 2000- 2001 Member of the Social Committee at AUB Alumni-Nursing Chapter
- 1998- 1999 Member of the Continue Education Committee at the AUB-SON

Honors/Awards

- Fall 2014 Virginia Commonwealth University: A. D. Williams Award
- Summer 2013 Virginia Commonwealth University: A. D. Williams Award
- Spring 2013 Virginia Commonwealth University: A. D. Williams Award

Certifications & Training Experience

- 2013 Society for Research on Nicotine and Tobacco Conference
- 2013 Virginia Youth Tobacco Projects Conference
- 2008- Present NCLEX-RN, New York State Board of Nursing licensure
- 2010 Neurosurgery Symposium at Kaleida Health and University at Buffalo
- 2008 & 2010 Identification and Reporting of Child Abuse in NYS Certification
- 2006 Graduating Project Defense: Physician-Nurse Satisfaction at AUB-MC
- 2006 Breast Cancer Conference
- 2006 SON Centennial Conference at AUB
- 2006 Dermatological Conference at AUB-MC
- 2005 Communication Skills Training at ABOTT
- 2005 Sales Process and Techniques Training at ABOTT
- 2004 Magnet Conference at AUB-MC
- 2002 Preceptorship and Mentorship Courses and Certifications
- 2000 Patient Centered Care and Discharge Planning Conference at AUB-MC
- 1998- 1999 Psychiatry Training at Saint George Hospital and AUB-MC
- 1998- 1999 Health Education at National Protestant College
- 1997- 1998 Nursing Training at AUB-MC as a BSN student

Skills

Languages: English, Arabic.
Computer: MS Word, MS Excel, MS Power Point, SPSS, JMP, Internet proficiency, html.