

Comparison of Personal Characteristics, Tobacco Use, and Health States in Chaldean, Arab American, and non-Middle Eastern White Adults

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Abstract This study compared and contrasted personal characteristics, tobacco use (cigarette and water pipe smoking), and health states in Chaldean, Arab American and non-Middle Eastern White adults attending an urban community service center. The average age was 39.4 (SD = 14.2). The three groups differed significantly ($P < .006$) on ethnicity, age, gender distribution, marital status, language spoken, education, employment, and annual income. Current cigarette smoking was highest for non-Middle Eastern White adults (35.4%) and current water pipe smoking was highest for Arab Americans (3.6%). Arab Americans were more likely to smoke both cigarettes and the narghile (4.3%). Health problems were highest among former smokers in all three ethnic groups. Being male, older, unmarried, and non-Middle Eastern White predicted current cigarette smoking; being Arab or Chaldean and having less formal education predicted current water pipe use.

Keywords Immigrants · Chaldean · Arab American · Middle Eastern · Smoking · Water pipe · Narghile · Health

Introduction

Migration to the United States (U.S.) from the Middle East began very slowly at the end of 19th century; those that did come came without families and returned. With the regional wars, strife, and political unrest that followed World War II, more and more came to the U.S. to stay and brought their families, kin, and cultures with them. Immigration from the Middle East has increased dramatically over the past sixty years [1] and southeastern Michigan has become home to the largest concentrations of Chaldeans and Arabs outside the Middle East [2, 3]. Historically, Chaldeans originated in northern Iraq, are Christian, and speak a modern version of Aramaic as their common language [4, 5]. There are about 80,000 Chaldeans in the U.S. today [6]. Arabs in America number almost five million [7]. They descended from a Semitic people that inhabited most of the Middle East and northern Africa and speak Arabic. They share a very long and complex history and the majority is Muslim [8]. As Chaldeans and Arabs have migrated around the world, they have carried with them their tobacco use traditions [9].

Tobacco Use

Tobacco use (primarily cigarette smoking) is the number one preventable cause of morbidity and mortality in the U.S. [10] and the second cause of death in the world, particularly in developing countries like those of the Middle East [11]. On average, 45% of the men and 5% of

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the women there smoke cigarettes. Countries with highest use include Iraq (40%), Yemen (45%), Lebanon (58%) and Tunisia (60%) [12]. Current cigarette smoking in the U.S. is 19.2% (20.8% for men and 17.6% for women) [13].

Tobacco use in any form harms nearly every organ of the body, causing more than 40 diseases and reducing the health of all smokers and those about them [10]. Every year an estimated 438,000 Americans die as a result of smoking and/or exposure to secondhand smoke, and for each person who dies from a smoking-related disease, twenty more are living with a smoking-attributable illness. Smokers die on average 13–14 years earlier than non-smokers [10]. The estimated costs of smoking-related medical expenses and loss of productivity in the U.S. exceed \$167 billion annually [14].

As there are no national or regional tobacco use data for Chaldeans or Arabs in America, it is not known what contribution they make to tobacco use costs. However, studies in an Arab American community in the Midwest provide some direction. Rice and Kulwicksi [15] found 40.6% of the men and 38.2% of the women in their community-based, randomly selected sample of Arab American adults were cigarette smokers; 75% were Lebanese and 97% had been born in the Middle East. The high smoking rate for Lebanese women is not typical of Middle Eastern women as a whole, but consistent with World Health Organization data for Lebanon [12]. A survey ten years later revealed similar findings [16]. In a Midwest health clinic study, 52% of the Arab American patients smoked; approximately 60% had lived in the U.S. ten years or less [17]. Jamil and colleagues [18] reported a 28% smoking rate in a community-based convenience sample of more than 6000 Arab American adults. None of the studies cited above reported on Chaldean smoking separately or on water pipe smoking by all.

Water Pipe (Narghile) Smoking

Water pipe smoking (WPS) or narghile smoking (also known as hookah, shiesha, and argihleh) is a historical and cultural form of tobacco use by many in the Middle East and North Africa. Traditionally a behavior of older males, its current use is growing in all age groups [19–21]. Many of the same health problems associated with cigarette smoking have been found for water pipe use [20, 21]. Although there are no Middle Eastern regional data on water pipe smoking, a national survey in Kuwait revealed 57% of the men and 69% of the women were using it there [22]. Tamim and colleagues [23] found 21% of Lebanon's college students smoked narghile on a regular basis; 12% smoked cigarettes as well. In a Syrian university study, 62.6% and 29.8% water pipe use, respectively, for young men and women students was documented [24]. In America, narghile smoking has been recorded for

adolescents of Middle Eastern and non-Middle Eastern descent [25, 26]. More data are needed on the growing use and health consequences of water pipe smoking around the world [27] and in America [28].

The specific research objective of this study was to compare and contrast personal characteristics, tobacco use (i.e., cigarettes and narghile), and health states in two Middle Eastern groups (Chaldean, Arab American) with non-Middle Eastern White adults.

Methods

Participants

A standardized survey available in English and Arabic was completed by or for 3543 adults, 18 years and older, attending an Arab American and Chaldean community center in a large mid-western city. The center provides access to health, human, social, and educational services for all whether they are of Middle Eastern heritage or not. Most of those that are served are of low socioeconomic status. The study was conducted between August 26, 2005 and October 25, 2005; the study sample size represents 5% of the clientele served that year [29].

The survey tool was available in English and Arabic and based on translation and back-translation procedures [30]. Preliminary pilot testing supported its reliability, validity, and readability. Of the completed surveys, those that self-identified as Chaldean, Arab American, or non-Middle Eastern White are included in this analysis. The final sample ($N = 1919$) was 30% Chaldean, 60% Arab, and 10% non-Middle Eastern White. Average age was 39.45 years and the Standard Deviation (SD) was 14.26; 61.5% were female; 71.9% were married; and 44.1% had not completed high school. Approval was obtained from the University's Institutional Review Board for the giving of Information Sheets to participants; the providing of survey data constituted informed consent.

Measures

Socio-demographic Characteristics

Participants were asked for information about their ethnicity, age, gender, marital status, time in the U.S., language spoken, education, employment, and annual income.

Tobacco Use Behaviors

Participants responded to questions adopted from the National Health Interview Survey [31] that asked about

current, former, and never tobacco use. *Current* use was defined as smoking in the previous 30 days. *Former* use was smoking at any time, but not in the past 30 days. *Never* smoking was no tobacco use ever, not even one or two puffs. All of these questions were asked for both cigarette and water pipe smoking; no other forms of tobacco use were identified.

Health States

Participants indicated their perception of their health on a 5 point Likert-type scale from 1 = poor to 5 = excellent. They also checked whether or not they had been medically diagnosed or treated for one or more of the following health problems: high blood pressure, high cholesterol, heart disease, diabetes, asthma, or depression. All of these conditions have been linked to chronic tobacco use [10, 32].

Procedures

Adults, 18 years and older, were approached in a community center by trained personnel and asked to participate: less than 1% refused. Most common reasons given for not participating were lack of time and/or lack of interest. Participants were given a detailed description of the study and a written Information Sheet that described the study. Then a trained bi-lingual data collector interviewed them. A code number was assigned to each survey form, this enabled retrieval of the survey for quality assurance purposes.

Data Analyses

Descriptive statistics were used to present the sample and they include means and standard deviations, and (as appropriate) percentages for the nominal and ordinal variables. Chi-square tests and analyses of variance were computed to examine group differences and logistic regression analyses used to examine the predictors of tobacco use. Because of the exploratory nature of the study, level of significance was adjusted for the number of tests related to the same research question. The Bonferroni formula, $.05/(\# \text{ of tests})$, was used for this purpose. This adjustment maintains the probability of Type 1 error (alpha) to less than .05.

Results

Personal Characteristics

In this study, all of the Chaldeans and Arab Americans were born outside the U.S. and 74% of the non-Middle Eastern White group was born in America. Of those born

outside the U.S., all of the Chaldeans and 36.8% of the Arabs were from Iraq; 43% were from Lebanon. Table 1 presents the personal characteristics of the three ethnic groups. Groups differed significantly ($P < .006$) on all of the descriptive variables except years in U.S. On the whole, non-Middle Eastern White respondents were younger and more likely to be female; Chaldean respondents were more likely than the Arabs to speak English as well as Arabic. Education, employment, and income levels were all significantly higher in the non-Middle Eastern White group. The variables that were significantly related to ethnicity are potential confounders and were considered carefully when analyzing differences in health by ethnic identity.

Tobacco Use Characteristics

Tobacco use for the whole sample was 22.1% for current cigarette smoking, 3% for water pipe smoking, and 3.2% for cigarette plus water pipe smoking. In addition, 14.8% identified as former smokers and 56.9% as never smokers. As shown in Table 2, this pattern of tobacco use differed by ethnic group, ($X^2(8, N = 1919) = 45.33, P < .01$). Analysis of the cell residuals greater than 2.0 revealed that non-Middle Eastern adults were more likely to be current cigarette smokers and least likely to be never smokers; Chaldean respondents were less likely to smoke both cigarettes and the narghile.

Personal Characteristics and Ever Smoked

The four categories of smoking history (i.e., current cigarette use, current narghile use, cigarette plus narghile use and former use) were combined to represent the category of 'ever smoked'. The percent of 'ever smoked' for each of the ethnic groups is shown in the top row of Table 1. The highest rate was observed in the non-Middle Eastern Whites at 58.6%. Each of the personal characteristics shown in Table 1 was examined in relation to 'ever smoked'. Chi-square tests of association found all of the eight personal characteristics except income were significantly related to smoking status ($P < .006$). The strongest predictors were gender (contingency coefficient, $CC = .35$), work status ($CC = .23$), and age ($CC = .17$) suggesting that older men with employment had the highest rate for 'ever smoked' tobacco.

Ethnicity & Ever Smoked

In order to examine the moderating role of ethnicity in these relations, logistic regression analyses were performed on the smoking percentage rates. The ethnic group by personal characteristic interaction was evaluated in each regression. Significant interaction effects were noted for

Table 1 Percent of respondents who had ‘ever smoked’ cigarettes or water pipe by ethnicity and frequency distribution (*n*) by personal and cultural characteristics (*N* = 1919)

Variable	Ethnic group					
	Chaldean		Arab American		Non-Middle Eastern White	
	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>
Ethnic group*	40.48	572	41.78	1149	58.58	198
Age group*						
18–24	28.2	71	28.2	134	56.1	41
25–34	22.2	153	22.2	313	57.9	76
35–44	40.3	124	40.3	321	65.8	38
45–54	46.5	86	46.5	134	60.0	20
55 and older	64.2	123	46.7	169	60.0	10
Male (Gender)*	73.3	217	63.8	469	59.6	47
Married*	38.4	417	40.5	874	50.0	76
In U.S. <11 Years ^a	31.9	279	37.7	504	43.5	23
Language spoken*						
English	41.8	91	49.2	189	64.4	149
Arabic	38.0	216	38.9	671	33.3	18
Arabic & English	41.1	246	43.4	226	38.9	18
Education (High school or more)*	42.3	300	45.2	602	55.1	156
Employed*	52.4	189	60.1	328	60.4	91
Annual income (\$25,000 or more)*	35.5	107	43.5	92	49.0	49

* $P < 0.006$ Note: The max *N* varied due to some non responses^a Years in US was only applicable to immigrants so max *N* was 1509. Only 44 non-Middle Eastern Whites answered this question**Table 2** Comparison of tobacco use (cigarettes and water pipe) of Chaldeans and Arab Americans with non-Middle Eastern White adults (*N* = 1919)

Tobacco use	Ethnicity					
	Chaldeans		Arab Americans		Non-Middle Eastern White	
	<i>n</i> ^a	%	<i>n</i>	%	<i>n</i>	%
Currently smokes cigarettes	124	21.7	231	20.1	70	35.4
Currently smokes narghile	15	2.6	41	3.6	2	1.0
Currently smokes cigarettes and narghile	8	1.4	49	4.3	5	2.5
Former smokers	84	14.7	159	13.9	39	19.7
Never smokers	341	59.6	669	58.2	82	41.4
Totals	572	100	1149	100	198	100

^a *n* = Number of participants in each ethnic group* $P < 0.001$

age and gender ($P < .006$). Age trends were strongest in the two Middle Eastern groups, the ‘ever used’ tobacco percentage among younger vs. older adults ranged from 28.2 to 64.2 in the Chaldean group, but only from 56.1 to 60.0 in the non-Middle Eastern White adults. Chaldean men reported more tobacco use than men in the other two groups. The percentage (73.3%) of ever smoking among the Chaldean men was higher than that found in either of the other two subgroups and higher than the overall

percentage in the ethnic group with the highest tobacco use, i.e., the non-Middle Eastern Whites.

Perceived Health and Diagnosed Health States

Overall, 45% of the sample had diagnosed health problems; 22% had at least one, 11% had two, 7% had three, 3% had four, and 2% had five or more. Mean perceived health for the sample was 3.29 (SD = 1.10) on the 5-point scale

Table 3 Adjusted and unadjusted mean perceived health and percentage of diagnosed health problems reported by Chaldean, Arab American, and non-Middle Eastern White participants ($N = 1919$)

Variable	Chaldeans ($n = 572$)		Arab Americans ($n = 1149$)		Non-Middle Eastern Whites ($n = 198$)	
	Adjusted mean or percent	Unadj. mean (SD) or percent	Adjusted mean or percent	Unadj. mean (SD) or percent	Adjusted mean or percent	Unadj. mean (SD) or percent
Perceived health range 1(poorest) to 5 (excellent) unadj.*, adjusted	2.72	2.69 (1.03)	2.84	2.81 (1.15)	2.96	3.22 (1.10)
Heart disease unadj.*, adjusted	3.7	6.3	6.3	9.6	1.6	1.1
High blood pressure unadj.*, adjusted	22.7	20.3	25.4	22.6	15.5	8.5
High cholesterol unadj.*, adjusted	12.5	22.5	14.2	24.6	9.5	7.5
Diabetes unadj., adjusted	7.9	9.3	9.8	9.9	8.6	7.0
Asthma unadj.*, adjusted*	6.2	5.0	11.3	9.1	18.8	13.8
Depression unadj.*, adjusted*	15.2	14.0	26.9	24.0	31.6	31.3

* $P < .006$

ranging from ‘poor’ to ‘excellent’. Table 3 presents perceived health means and the reported health problems by the three ethnic groups. Adjusted and raw or unadjusted figures are shown. The eight variables related to ethnicity (Table 1) were used as covariates. Without covariate adjustment, those with a Middle Eastern background had significantly higher levels of high blood pressure ($\chi^2 = 19.45$, $P = .001$), hypercholesterolemia ($\chi^2 = 26.92$, $P = .001$) and heart disease ($\chi^2 = 18.35$, $P = .001$) than did the non-Middle Eastern Whites. No differences were found for diabetes by ethnic identity. The highest depression problems and asthma were reported by the non-Middle Eastern Whites ($\chi^2 = 31.08$, $P = .001$) ($\chi^2 = 16.31$, $P < .001$). After adjusting for between group differences, a different picture emerged. Middle Eastern background was no longer associated with high blood pressure, hypercholesterolemia, or heart disease, yet non-Middle Eastern Whites still had significantly ($P < .006$) higher levels of depression and asthma.

Health Status and Tobacco Use

Table 4 presents the incidence of diagnosed chronic illnesses by reported smoking status (current, former or never). For each health condition, with the exception of asthma, current or former use was significantly higher than never smoking.

Predictors of Tobacco Use

Logistic regressions were used to determine which of the demographic and cultural characteristics in Table 1 predicted cigarette and/or narghile smoking. A forward stepwise procedure was used to identify significant sets of predictors for each outcome model. Variables were entered according to improvement in chi-square reduction. Using this approach four significant predictors emerged for being a current cigarette smoker. These were being (a) male, (b) non-married, (c) non-Middle Eastern White, and (d) older. Two factors (being Arab and having less education) explained current narghile smoking.

Discussion

Personal Characteristics

The objective of this study was to assess and compare personal characteristics, tobacco use (cigarette and/or narghile), and diagnosed health states in three adult ethnic groups completing surveys in a community center. It was not surprising that the majority of those surveyed were Chaldean (30%) and Arab American (60%) versus non-Middle Eastern White (10%) as these were the two most represented groups in the area. Findings also showed that

Table 4 Comparison of diagnosed health problems reported by current, former, and never smokers ($N = 1919$)

Variable	Current smoker (%)	Former smoker (%)	Never smoker (%)	P Value
Heart disease	7.5	16.5	5.6	0.001
High blood pressure	17.0	31.3	19.3	0.005
High cholesterol	20.9	41.8	17.6	0.001
Diabetes	8.3	17.4	7.9	0.027
Asthma	8.6	9.8	7.9	0.597

they were the most married, least educated, and had the lowest incomes along with the most unemployment. This picture is consistent with other studies of immigrant groups in America. Based on 1993 and 2003 National Health Interview Surveys, researchers found immigrants, as a rule, had higher marriage rates, fewer marital dissolutions, and were more likely to reside in urban and inner-city metropolitan areas than native-born Americans. In addition, immigrants tended to have lower socioeconomic achievement than natives, as measured by their lower educational attainment, family income, occupational status, and employment rates [33, 34].

Tobacco Use Characteristics

It was expected that those from the Middle East, consistent with World Health Organization reports [11, 12], would report higher cigarette smoking rates than they did. A reason for the lower cigarette smoking among Chaldeans and Arab Americans could be the higher cost of cigarettes in the U.S. [35]. Until immigrants are economically established in their new homeland, many cannot afford the luxury of cigarette smoking.

Ethnicity and ‘Ever Smoked’

It was not surprising that water pipe smoking was higher among the Arab Americans as this form of smoking has been recorded as a cultural activity in the Middle East for well over 500 years [19] and supports the observation of Kandela [9] that many Arabs take this personal habit with them as they migrate around the world. Actually, it was expected that there would be more water pipe smokers among those from the Middle East (Chaldeans and Arab Americans) than was reported based on recent Middle East data [12]. It could be that some smokers had already switched to the convenience of cigarette smoking or were unwilling to acknowledge this traditional behavior in their adopted country where it is not as common.

Contrary to these findings are those for Arab American adolescents (14–18 years). In a high school sample ‘*ever*’ water pipe smoking was higher than cigarette smoking, ranging from 28% in the 9th grade to 50% in the 12th grade. Although there was a very small percentage (1%) of water pipe smoking reported in this study by non-Middle Eastern adults, 5% current use was found by non-Arabs in the 9th grade and 16% in the 12th grade of the adolescent study. Narghile use was a very strong predictor for current cigarette smoking in that study [36]. It may be that narghile smoking is a gateway to higher rates of cigarette use in the long run and it is also possible that water pipe smoking may become a substitute for cigarettes because it is less

costly. The use of any type of tobacco raises questions about health status [10, 32].

Diagnosed Health States

Forty-five percent (45%) of the study participants reported diagnosed health states. This is very high for such a young population (the average age was less than 40) but does explain, in part, why they were seeking community services. Middle Eastern participants reported more heart disease, high blood pressure, and high cholesterol levels than did non-Middle Eastern Whites; they were also significantly older. See Table 1. These findings are not consistent with those of Singh and Hiatt [33, 34] who looked at immigrant health and found that, compared with their US-born counterparts, immigrants tended to report lower rates of hypertension, elevated cholesterol, poor health status, asthma, heart disease, and diabetes prevalence and as a rule, tended to be much younger.

They also found that immigrants were 50% less likely to report smoking cigarettes than US-born individuals of similar socioeconomic and demographic background. As noted earlier, significantly more of those from the Middle East had been in this country three years or less and, like many other U.S. immigrants, faced important challenges in their socioeconomic attainment, labor force participation, and health care utilization patterns, as they grappled with relatively high poverty and unemployment. Also, many may have lacked health insurance and experiences with preventive health care.

Health State and Tobacco Use

It was not surprising that the non-Middle Eastern Whites had more asthma problems as they reported significantly higher cigarette smoking rates and had been living longer in a western industrial environment. Among Arab Americans, Johnson and colleagues [36] found asthma prevalence was much higher among immigrants who had been in the U.S. longer compared to those who had come less than one year ago.

Implications for Research and Practice

The significant relationship found between health problems and current or former smoking (Table 4) is consistent with the Surgeon General’s report of tobacco use and smoking-related diseases [10]. What is interesting in this study is the proportion of participants who reported diagnosed health problems, but were now *former* smokers. It is not known how long these participants had smoked, how much they had smoked, how long ago they had stopped, or whether they had stopped on the advice of their health care provider

once they were diagnosed with a problem. Answers to these and many other questions about patterns and trajectories of tobacco use need to be address in a future study.

Clinicians and health care providers need to obtain very detailed smoking histories in addition to general information about current smoking behavior. This is particularly important when clients come from other cultures and places in the world where smoking is defined and practiced differently. Tobacco use history questionnaires suitable for Chaldean and Arab immigrants should ask for more information about a history of narghile use and exposure. Were former smokers more likely to have been narghile users? Were a significant number of the current cigarette smokers also *former* narghile smokers? What are the water pipe patterns of use in the home? These are some of the questions important for targeted interventions and for providers of health information. It is critical that tobacco use of any kind be assessed early and consistently by health care providers and that advice be given to stop smoking repeatedly. Stopping smoking at any age increases health and long-term survival [37].

Limitations

Several study limitations are identified. A major one 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. A more evenly distributed sample size could have provided more accurate estimates of both cigarette and narghile smoking for the respective groups. An additional issue was the data collection process itself. Even though participants were interviewed in the language of their choice, survey items and the experience of being questioned and asked for responses could have presented problems and/or a threat. With the intense anti-smoking efforts going on in America and in this state today, it may have been difficult for participants to admit to any tobacco use. Lastly, there is a problem with the limited amount of information on tobacco use patterns and trajectories in these three ethnic groups. It is not known how long folks had smoked or the strength of their habit(s) across the years. Such information plus data on cessations and relapses (if any) could have contributed to a more comprehensive picture of tobacco use by these respective ethnic groups.

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