

ORIGINAL ARTICLE

PREVALENCE AND BEHAVIOUR OF SMOKING MEDWAKH AMONG ABU DHABI-UNITED ARAB EMIRATES' POPULATION: A CROSS-SECTIONAL STUDY

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ABSTRACT

Medwakh is one of the non-cigarette products that has recently emerged as a public health problem in the United Arab Emirates. It is a narrow pipe filled with dried tobacco leaves and is mixed with herbs, spices, or at times with a bark known as 'dhoka' (meaning 'dizzy' in Arabic). The purpose of the current study is to determine the prevalence and behaviour of Medwakh smoking among the general population of Abu Dhabi, United Arab Emirates. For this objective, the authors conducted a descriptive, quantitative, cross-sectional study. The three main outcomes were never smokers, current smokers (6 months or older) and the number of Medwakh smoked per day. Smoking behaviour, sociodemographic factors and the attitudes of the study participants were assessed in this study. The outcomes from the regression models identified the association between each outcome measure and age, gender, income, education level, marital status, smoking for ≥ 6 months, and parental and peer smoking. The prevalence of the current Medwakh intervention in Abu Dhabi was found to be 22.5%. The average age at which the respondents started smoking was 25 years. Daily Medwakh users smoked a median of 3.0 per day. The highest prevalence rate for Medwakh smoking was reported among men (29.9%), single individuals (24.2%), and younger age groups (18-37 years-37.5%) with bachelor's degrees (29.3%). The same outcome was also true among the users, who smoked for more than 6 months (41.9%) and the participants who had colleagues or parents with smoking habit. The study also found income differences among the study participants. The awareness about damage reduction was extremely high among the Medwakh users (78.8%). No participant reported that they were denied a Medwakh purchase on the basis of their age. Medwakh is considered as a herbal substance with no health hazard in Abu Dhabi, United Arab Emirates and is prevalently consumed at high rates. It has also heavily burdened the perceptions of harm. Further research into smoking behaviour is needed to determine the rest of the variables that heavily influence the smoking decisions.

Keywords: United Arab Emirate, Dhokha, Hookah, sociodemographic factors.

INTRODUCTION

Tobacco epidemic is one of the major public health threats encountered by the global nations, killing more than 8 million people every year. More than 7 million deaths are due to direct tobacco use whereas the death of 1.2 million non-smokers is a result of getting exposed to second-hand smoke (WHO-2021). In UAE, the prevalence rate of smoking was in the range of 23.4% to 24.7% for the year 2021, according to the World Health Organization (WHO-2021).

Various researchers have established the relationship among cigarette smoking, morbidity and mortality (Suliankatchi RA et al. 2019). The epidemiological studies that demonstrate the link between smoking and mortality, emphasized the need for additional information about the risks of smoking and the populations that get affected. As a result, the researchers stressed the importance of collection and segregation of sociodemographic information regarding the variables such as age, gender, income and so on (Siahpush M et al.2012).

In the United Arab Emirates (UAE), tobacco consumption has increased significantly in the recent years among the young adults (Al-Houqani M, Leinberger-Jabari A et al. 2019). Though smokers make numerous attempts to quit smoking cigarettes, they usually fail (Palipudi KM et al. 2012). In 2016, 55.1% young adult smokers self-reported that though they tried to quit smoking in the past year, only 7.5% were able to quite smoking successfully (Monroe et al. 2016). Smoking cessation depends on many factors among which cigarette consumption pattern is a crucial one as it includes age of smoking initiation, type and frequency of smoking.

Various factors motivate an individual to smoke which include stress, alcohol consumption, drug abuse and peer smokers (Suliankatchi RA et al.2019). From the literature (Buhelt LP et al.2021), it is quoted as follows, "As you are a student always you hear: When I'm headed off to class, if I know I'm going to be stressed out, I try to beat myself to it, and calm myself down. Knowing that I'm going to be annoyed, I have to smoke which makes me

feel better, which let us to think about the *association between smoking and stress*". Among the study population, 25.5% reported high stress levels whereas 16% were daily smokers. With regards to alcohol consumption, the study showed that 71-75% of frequent binge alcohol consumers tend to smoke. The rate of smoking generally increased as the frequency of drinking increased (Jiang N et al. 2014). While S. Lai revealed the association between smoking and illegal drug use, his study results infer that those with smoking habits are more likely to consume cocaine (OR = 7.5; 95% CI: 5.7-9.9), heroin (OR = 16.0; 95% CI: 6.8-37.9), crack (OR = 13.9; 95% CI: 7.9-24.5) and marijuana (OR = 7.3; 95% CI: 6.2-8.7) (Shenghan Lai et al.2020). In another study published in 2019, the relationship between peer pressure and smoking was investigated and the study found a higher odds of cigarette smoking among the students who experienced peer pressure than those who didn't (OR: 2.68, 95% CI: 2.37, 3.03) (Leshargie CT et al.2019).

Alike Medwakh, Dokha is also a non-cigarette tobacco product that has become a public health concern in the recent years in the United Arab Emirates. Dokha or barks are filled in a narrow pipe along with dried tobacco leaves, herbs, spices etc., (Arabic for "dizzy") (John L.J. and Muttappallymyalil J et al.2013). In general, three main types of Dokha blends are used such as cold (light), warm (medium) and hot (strong) Dokha. These types of blends refer to the strength levels of the buzz rather than the amount of Dohka smoked (John L.J. and Muttappallymyalil J et al.2013). In the UAE, Medwakh costs seven times cheaper than the cigarettes (Al-Houqani M., Ali R.2012).

Smoking a hookah or Medwakh pipe is highly popular not only in the United Arab Emirates, but across the Middle-east. A new study conducted among the Emiratis provides further evidence that smoking medwakh causes heart disease. In 2019, the historical and the then Medwakh utilization stood at 18.5%. The prevalence of Medwakh smoking among wealthier men was found to be higher (Jawad et al. 2019). In general, Medwakh users smoke the Arabic-mixed tobacco known as Dokha whereas hookah is often dipped in molasses or honey or mixed with fruit. Most young people bypass the restriction for 18-years in stores and shop online. These young population mentioned about the quick addiction towards Medwakh immediately after their first dose ("Hooked after one drag": Warning as pupils get a taste for addictive medwakh). Also, Dokha's weekly supply was cheaper than the weekly supply of cigarettes in Dh11 than Dh77. Though the Medwakh smokers in the UAE are aware about its high mortality rate, they still prefer to consume it.

In this background, the aim of the current study is to determine the key patterns and trends in Dokha tobacco usage among the target audience in Abu Dhabi, UAE. Efficient identification of the key patterns and trends in tobacco usage among the study population is a major achievement for the efforts taken to mitigate the burden of tobacco-related morbidity and mortality. Furthermore, the current study findings will enhance the level of awareness regarding Dokha tobacco usage and the ill-effects of smoking behaviour. There is a need exists for designing effective intervention to reduce the Dokha tobacco usage among the individuals and identify the pattern and the implementation plan for such interventions to accomplish the mission.

METHODS

Design

The authors conducted a descriptive, quantitative, cross-sectional study in which a self-administered survey was conducted, consisting three main sections such as sociodemographic variables, consumption patterns, and other factors including peer and family factors. Among the study population, the sample size for the study was calculated using the formula given below.

$$n=Z^2P(1-P)/d^2=245$$

Where n = sample size,

Z = Z statistic for the level of confidence at 95% i.e., 1.96

P=expected prevalence (according to the literature, the prevalence of current Medwakh use in UAE was 18.5 (95% CI 17.3-19.7) (Mohamad Jawad et al, 2019).

d=precision (in proportion of one, d= 0.05).

Therefore, the sample size calculated for the current study was 245 individuals while the target age is 12 years old and above, including men and women living in Abu Dhabi, UAE. The data was collected using an online quality survey. These questionnaires were then hand-delivered in public places at Abu Dhabi, UAE including malls, cafes, parks, restaurants, and supermarkets to collect the data from potential respondents. The questionnaire was developed from the Global Tobacco Surveillance System and the National Tobacco Survey using a modified version of their 2013-26 questionnaire. The use of survey questions from previous validity survey lent the validity to the current study. The language of the questionnaire was both English and Arabic and was tested among 10 individuals. Based on the pilot study outcomes, some of the questions in the questionnaire were rephrased. Then, the actual data was collected through an online quality survey. The questionnaire

had a total of 27 forced response items and was divided into three sections as briefed below.

1. The first section has to be completed by all the respondents and included questions pertaining to the following measures:
 - Sociodemographic information including age, gender, level of education, Marital Status and income status (items 1 to 5).
 - Smoking status of their parents and siblings (item 6).
 - Current smoking status (Items 7 and 8).
2. The second section has to be completed only by those who were previous smokers or are smoking regularly at the time of participation in the study. It had a total of eight questions including smoking history, type of tobacco preferred, amount smoked, purchase location and smoking location etc., (9 to 16).
3. The third section has to be completed by all the respondents and contained 11 questions including peer pressure, stress, drugs and alcohol factors (17 to 27).

Measures

The outcome measures included daily prevalence measures (current smokers, past 30 days), daily smoking, number of Medwakh smoked per day, number of days in a month smoking Medwakh, age at first attempt to use Medwakh, smoking over 6 months and attitudes (respondents' opinions about smoking, increased peer-influenced propensity to smoke and increased perceived comfort). Accessibility (smoking shops, smoking facilities) and policy measures (refusal to sell based on the age) were also investigated. The authors conducted bivariate and multivariate analyses to determine the relationships between smoking Medwakh and other independent variables such as age, gender, marital status, income, level of education, current smoking status (past-30 days), parent and peer tobacco use status, psychiatric drugs, peer pressure and alcohol.

Analysis

The author analysed the descriptive data using weighted percentages. Bivariate analyses were performed between the prevalence outcome measures (current smoking, number of Medwakh smoked per day, Medwakh smoking days per month and smoking status over 6 months) and independent variables. The total sample population was categorized for their behavioural attitudes based on their Medwakh status (present, never) to identify the subgroup patterns among them. Logistic regression was used to select the predictors since the data included categorical independent variables and one dichotomous dependent variable (current

smoking and the number of Medwakh smoked per day - linear regression - Medwakh users only). Multiple imputations were performed to detect the selection biases due to missing data. In addition, the authors also conducted multivariate imputation using chained formulas. Statistical significance was tested using chi-square statistic with an alpha value of 5%.

RESULTS

Sample characteristics

The socio-demographic characteristics of the current study sample (N = 245) are shown in Table 1. With reference to age, the sample population was divided into four groups such as children (ages 12-17), young-aged adults (ages 18-47), middle-aged adult (ages 48-63) and more-older adult (ages 64 and above). The minimum age of the respondents was 12 years and the maximum age was 73 years whereas the average age was 36 years. The top respondents were men (54.29%) and were single (44.08%). Moreover, the educational background of the respondents was in the range of elementary school to graduation. Around 40.41% of the respondents hold a bachelor's degree. According to papayaglobal.com, the income of the sample population in the UAE is divided into three different groups such as minimum salary (less than AED 3000 or equivalent to \$816), average salary (AED 4000-15000 or \$1090-4080 approx) and high salary (Over AED 16000 which is approximately \$4355). Out of the total sample population, 54.3% participants have an average salary. Further, 79.2% respondents had at least one smoking parent or sibling and 50.2% had some friends who smoke. Additionally, 52.7% were smokers in the past 30 days.

Medwakh use

The prevalence of current Medwakh usage was 22.5% (95% CI 35.3-39.7). Most of the current users i.e., 37.5% fall under the young age group. Daily Medwakh users smoked a median of 3.0 Medwakh per day (interquartile range (IQR) 1.5 to 6.5) whereas Medwakh users smoked a median of 22 days in a month (IQR 18 to 26.0). The median age at first Medwakh usage was 25 years (IQR 22.5-26.5). Table 2 shows the results of bivariate and multivariate analyses after multiple imputation. The prevalence of current Medwakh smokers was almost higher in men (29.9%) than in women (8.0%), especially among the singles (24.2%), even after adjusting for other factors in multivariate analysis.

In addition to the above, current Medwakh usage was found to be significantly higher among those who had smoked for 6 months or above (41.9%), users with a bachelor's degree (29.3%), average-salary users (16.2%), and users reporting tobacco use due to peer or parents' smoking behaviour. A

significant association (p-value less than 0.05) was found between current Medwakh usage and other factors such as age, gender, marital status, education level, income, smoking for 6 months or

more, and those reporting peer or parent smoking. This outcome indicate the presence of a significant association between sociodemographic factors and smoking Medwakh.

Table: 1. Sample Characteristics (N=245)

Variable	Frequency	%
Age		
Child (12-17)	38	15.5
Young-aged adult	146	59.6
Middle-aged adult	43	17.6
More-older adult	18	7.3
Gender		
Male	133	54.29
Female	112	45.71
Marital Status		
Single	108	44.08
Married	86	35.1
Divorce	29	11.84
Widow	22	8.89
Level of Education		
Elementary graduate	47	19.18
High school graduate	80	32.65
Undergraduate	99	40.41
Postgraduate	19	7.76
Income Level		
Minimum salary	77	31.4
Average salary	133	54.3
High salary	35	14.3
Parents or sibling smoke		
Yes	194	79.2
No	51	20.8
Do any of your closest friend's smoke?		
All of them	15	6.1
Most of them	54	22
Some of them	123	50.2
None of them	53	21.6
Current smoking		
No	116	47.3
Yes	129	52.7

Table 2: Chi-Square analysis outcomes establishing the relationship between socio-demographic factors and Smoking Dokha (Medwakh) for more than six months in Abu Dhabi, United Arab Emirates-Abu Dhabi

	Smoking Dokha (Medwakh)				P value
	Yes		No		
	n	%	n	%	
Age Group					0.003
Child	6	18,2	27	81,8	
Young Adults	27	37,5	45	62,5	
Middle-Aged Adults	13	17,6	61	82,4	
Old-Aged Adults	9	13,6	57	86,4	
Sex					0.0001
Female	9	8,0	103	92,0	
Male	46	29,9	87	65,4	
Marital Status					0.009
Single	35	24,2	73	67,6	
Married	14	16,3	72	66,7	
Divorce	4	13,3	26	86,7	
Widow	2	9,5	19	90,5	
Level of education					0.021
Undergraduate	22	29,3	70	70,7	
Postgraduate	4	21,1	15	78,9	
High School Graduate	19	23,8	61	76,3	
Elementary Graduate	3	6,4	44	93,6	
Income					0.026
Minimum salary	17	8.4	55	23	
Average salary	24	16.2	95	38.1	
High salary	15	7	17	7.3	
Parent or sibling smoke					0.013
Neither smoke	12	8.5	39	76.5	
At least one parent smokes	43	22.2	151	77.8	
smoking for more than six months					0,0001
Yes	54	41.9	75	58.1	
No	1	0.9	115	99.1	
Peer tobacco status					0.0001
None smoke	28	40.8	93	40.7	
At least some friends smoke	27	50.2	97	50.3	

Behavioural and policy attitude

Table 3 shows the breakdown of behavioural attitudes surveyed across the sample in terms of Medwakh usage. In general, 78.8% of the current Medwakh users perceived Medwakh to be low harmful, as they assumed that Medwakh smoking doesn't harm their health. Unfortunately, 98% of the Medwakh users who tried to buy Medwakh in the last 30 days reported that no one refused to sell them because of their age while 2% said they had not tried to buy Medwakh in the last 30 days. Among those respondents who identified themselves as Medwakh users, at the time of

conducting the survey, 54.4% perceived that smoking would make people comfortable. On the other hand, 34% mentioned that it made no difference whereas only 11.6% said that smoking makes people less comfortable during stress. Among the current Medwakh users (in the past 30 days), 33.8% reported using Doha tobacco from someone else, 60% from Medwakh's shops or grocery stores and 2% from other routes. Furthermore, among the current Medwakh users, smoking was a common sight at their homes (56%), followed by cafe shops (43.6%), public places (34.7%) and educational / work institution (0%).

Table 3. Behaviours stratified by Medwakh use status

Behavioural attitude	Full sample N=245	Current Medwakh use N=55
Do you think Dokha smoking is harmful to you?		
Probably or definitely yes	10 (4%)	12 (21.2%)
Probably or definitely not	235 (96%)	43 (78.8%)
During the past 30 days, did anyone refuse to sell you Dokha because of your Age?		
Yes	0 (0%)	0 (0%)
No	50 (20.5%)	53 (98%)
I didn't try to buy Dokha.	195 (79.5%)	2 (1.9%)
Do you think smoking helps the people feel more comfortable or less comfortable during stress?		
More comfortable	101 (40%)	30 (54.4%)
No different	83 (34%)	19 (34%)
Less comfortable	61 (26%)	6 (11.6%)
The last time you smoked during the past 30 days, how did you get them?		
Tobacco shop	65 (50%)	24 (42.8%)
Supermarket or Grocery store	46 (35%)	10 (17.2%)
Café shop	19 (15%)	1 (2%)
Gas station	11 (8.5%)	0 (0%)
Someone else	44 (33.8%)	19 (33.8%)
During the past 30 days, where did you smoke?		
At home	100 (41%)	31 (56%)
At Cafe shop	68 (28%)	24 (43.6%)
At educational / work institutions	2 (1%)	0 (0%)
At public places	83 (34%)	19 (34.7%)

Table 4 shows the association between other factors related to smoking behaviour among the Abu Dhabi population. These factors include peer factor, psychotropic drugs and alcohol. The study found no significant association between psychotropic drug usage and smoking behaviour. Also, according to chi-square analysis results, the p-value between Medwakh smoking and alcohol consumption was

0.016 i.e., less than 0.05. This indicates the presence of a significant association between smoking Medwakh and drinking alcohol. Additionally, the p-value between the peer factor and current Medwakh consumption was 0.000. This value indicates the presence of a significant association between smoking friends and current Medwakh users.

Table 4: Chi-Square analysis outcomes establishing the relationship between other risk factors and smoking Medwakh for more than six months in Abu Dhabi, United Arab Emirates

Variable	Yes	No	P-value
Do you feel pressure by your friends or classmates to smoke?	28 (51.8%)	27 (48.2)	0.000
Do you usually smoke after consuming psychiatric drugs?	17 (41.5%)	24 (58.5)	0.628
Do you usually smoke after consuming alcohol?	20 (58.5%)	14 (41.2%)	0.016

DISCUSSION

Several studies on tobacco smoking reported different prevalence percentages regarding smoking habit. This discrepancy is attributed to several factors such as the data collection methods, geographic location, age group, gender, and the level of education (AlmogbelYS et al.2013). In the current study, the authors estimated the prevalence of Medwakh smoking and also examined the role played by sociodemographic variables and other risk factors in predicting Medwakh usage among the study population in Abu Dhabi, UAE. The percentage of participants smoking Medwakh during the conduct of the study was 22.5 %, which is higher than the previous study findings (18.7%) (Jawad M et al.2019). According to Ayesha Siddiqua, only 6.3% smoked medwakh in the year 2018 (Ayesha Siddiqua et al.2018). In general, most of the studies conducted in the UAE showed the prevalence of Medwakh smoking between 12.5% and 39% (Ayesha Siddiqua et al.2018; Shaikh RB et al. 2012).

The differences found in the prevalence rate among these studies in the UAE and other countries may be related to the sampling method, location, sex, age of the participants and other factors. However, it is clear that most of these studies conducted in the UAE showed similar rates as that of the current study outcomes since the study population included individuals over the age of 12 living in Abu Dhabi. Moreover, a recent study conducted in Lebanon found the smoking prevalence of Medwakh to be 4.6% while this value is lower than the proportion of smokers in the current research (Afifi R et al. 2018). This difference in the prevalence of Medwakh consumption between the UAE and Lebanon may be due to liberal culture, availability of Medwakh products, and tourism.

In terms of socioeconomic characteristics, the current study identified significant associations between age, sex, marital status, level of education, income with that of the current Medwakh smoking habit. However, no previous studies found a significant association between age and Medwakh smoking. It has been found that as people get older, they are less likely to engage in risky behaviours such as drinking alcohol and smoking (Ayesha Siddiqua et al.2018; Rolison JJ et al. 2014; Afifi R et al. 2018). With regards to marital status and income, the current study results were similar to that of the studies conducted in China, which found that married participants tend to smoke heavily (Yang M et al. 2012).

With respect to academic studies, the current study results are similar to the previous study outcomes attained by Almgobel et al. The authors found a significant association between academic performance and smoking (Almgobel YS et al. 2013).

About consumer behaviour, the frequency of smoking Medwakh daily (3 Medwakhs per day) in the current study was slightly lesser than the previous study (8.0 vs. 12.1 per day) (Jawad M et al. 2019) and in another study with a small-sample size covering Dubai students (6.4 per day) (Crookes A et al. 2014). The accuracy measures show that the usage patterns varied considerably between the individuals. Other prevalence studies have also reported similar results regarding Medwakh consumption with higher rates among men (Jayakumary M et al.2010; Al-Houqani M et al. 2012; Abdulle A et al. 2018).

Among adults, the median age (25 years) of Medwakh smokers was several years younger than the rest of the tobacco users (33 years) (Al-Houqani M et al. 2012). As reported by Afifi R et al (Afifi et al. 2018), tobacco consumption in ways other than Medwakh remains a significant predictor of smoking Medwakhs. This study also found a significant association between current smoking and Medwakh users.

A final chi-square analysis was conducted in this study and the results found the presence of friends who smoke cigarettes or Medwakh was significant associated with Medwakh users. A previous study confirms the association between Medwakh exposure and midwak smoking (Siddiqua et al. 2018). Additionally, another study showed that the presence of smoker friends is an important indicator of being a smoker (Almogbel YS et al.2013). Similar results found in other studies too demonstrate the peer effects on the initiation of various types of smoking including Medwakh (Alanazi N et al. 2019). This is an important finding, because peers exert some influence on the behaviour and can be used to encourage healthy behaviour.

Regarding alcohol consumption, the current study outcome shows a significant association between smoking and alcohol consumption. Another study too found a significant association between smoking and the prevalence of high-risk drinking (Monroe J et al.2016). Additionally, the Ozer's study found that alcohol consumption may increase the risk of smoking (Ozer EJ et al. 2008).

LIMITATIONS

In general, the study has a limitation i.e., its findings cannot be generalized across the UAE. The United Arab Emirates is made up of seven emirates, of which the current study covered only one emirate i.e., Abu Dhabi. Since all the indicators were self-reported, this phenomenon may have introduced biases such as social desirability. However, the authors did not collect any personally identifiable information from the participants due to which this scenario may have a little impact on the outcomes.

The cross-sectional design of the studies also limits the ability to draw conclusions about the causality of Medwakh usage. To be specific, the information was collected from all the open places except educational institutions, as the authors were unable to convince the institutions for the conduct of this study for diverse reasons. In spite of this drawback, the authors were able to bring the participation of understudies, exterior from their schools or colleges. Moment limitation, the question number 24 i.e., “Do you devour drugs other than those endorsed by a specialist for restorative reasons?”, this address was approximately drug abuse and unfortunately nobody replied for this question as yes. This is because, drug usage is considered as a private address in the Middle Eastern Country. This scenario creates an opaque relationship between smoking and drug abuse. There are exceptionally restricted ponders, which examined Dokha smoking behaviour among the populace in the UAE.

CONCLUSION

The current study provides the evidence upon the widespread usage of Medwakh by people from various age groups in Abu Dhabi, UAE. The growth of the Medwakh market and its spread beyond the United Arab Emirates should be brought under radar by the public health and tobacco control communities. Further, in-depth research about Medwakh is needed in the UAE, including ongoing monitoring, reasons for use, interactions with other tobacco products, and risky behaviour. In addition to these, the qualitative research is prioritized to understand the reasons and context behind the usage of Medwakh. Also, the ongoing efforts in this regard and gathering information on the potential adverse health effects of Medwakh should not delay the discussion and the implementation of policy guidelines. Furthermore, health warning recalls and restricted common sales to minors should be prioritized. The Public Health Centers at Abu-Dhabi should conduct a research study to assess the cigarette price, elasticity of Medwakh demand and the reciprocal price elasticity with other tobacco products. Finally, the implementation of the Framework Convention on Tobacco Control by Medwakh should be a priority for the UAE.

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Conflict of Interest

The author declares no conflict of interest.

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