

# Prevalence of and attitudes to waterpipe smoking among Saudi Arabian physicians

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## Abstract

**Background:** Tobacco smoking kills more than 5 million people annually and it is the most important cause of preventable death. Waterpipe smoking is common in the Middle East and is prevalent among young people. There is a misconception that it is less harmful than cigarette smoking. Physicians are considered role models in the community and their behaviours and attitudes towards smoking can have direct effects on cessation.

**Aim:** The aim of this study was to estimate current prevalence, attitudes and associated factors in regard to waterpipe smoking among Saudi Arabian physicians.

**Methods:** Using a self-administered questionnaire, we conducted a cross-sectional study among 454 male and female physicians from 3 specialties, and of various levels of training working in 4 hospitals in Riyadh.

**Results:** The prevalence of waterpipe smoking was 45%, greater in men than in women (58% vs 18%;  $P \leq 0.001$ ) and in surgical than in medical specialists (58% vs 38%;  $P \leq 0.001$ ). More non-smokers than smokers believed that physicians should serve as role models (79% vs 60%;  $P \leq 0.001$ ). Physicians who were waterpipe non-smokers had received more formal training about cessation than smokers (50% vs 36%;  $P \leq 0.001$ ).

**Conclusions:** Waterpipe smoking among Saudi Arabian physicians is frequent and is associated with low exposure to information about the hazards and cessation during medical education.

Keywords: Smoking, Water-pipe, Saudi Arabia, Physicians, Medical Education

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## Introduction

Tobacco smoking in all forms kills more than 5 million people per year and it is the most important cause of preventable death (1). According to the World Health Organization, tobacco smoking is the second most common cause of death and the fourth most common risk factor for disease worldwide. If current trends continue, smoking will cause 8 million deaths per year by 2030 (1).

Waterpipe smoking, also known as *shisha*, *hubble-bubble*, *hookah*, *muassel* or *narghile*, is another form of tobacco use which is common in restaurants and coffee shops in Middle East and many parts of the world in which young people commonly use this method of smoking. There is a misconception that waterpipe smoking is less harmful than cigarette smoking because the smoke passes through water and may be filtered by the water before it is inhaled. The World Health Organization issued a report in 2005 about waterpipe tobacco smoking and called for research on methods to evaluate smoker exposure and tobacco-smoking surveys among health professionals (2).

In Saudi Arabia, previous studies have reported the prevalence of waterpipe smoking in male medical students in central Saudi Arabia at 13% (3) and in eastern

Saudi Arabia at 12.6% (4). Physicians are considered role models in the community, and their behaviours and attitudes towards smoking can have direct effects on smoking cessation. Physicians (medical doctors) are responsible for providing advice and education about quitting and preventing smoking. Previous studies on waterpipe smoking among Saudi Arabian healthcare professionals were limited to medical students in a single college or centre, and limited information is available about knowledge and attitudes towards waterpipe smoking in practising physicians. The objective of this study was to investigate the prevalence, attitudes and associated factors of waterpipe smoking among Saudi Arabian physicians working in 4 hospitals in Riyadh, Saudi Arabia.

## Methods

### Sample size

Sample size was calculated using the Raosoft sample size calculator ([www.raosoft.com](http://www.raosoft.com)). The sample size was calculated by anticipating 30% prevalence of waterpipe smoking with  $z = 1.96$  for a 95% confidence level, margin of error of 5%. The minimum sample size required to estimate a population parameters was estimated at 450.

## Survey

We used a specific structured questionnaire modified from the Global Health Professional Survey, an international standardized questionnaire developed by the World Health Organization, the Centers for Disease Control and Prevention and the Canadian Public Health Association to collect information on tobacco use and cessation counselling among health professional students about smoking prevalence, characteristics (including waterpipe smoking), attitudes, perception, and exposure to smoking cessation training (5). The questionnaire had been previously translated and validated for a number of languages, including Arabic.

We carried out the survey during January and February 2015. Physicians were approached by data collectors (medical students) and the objectives of the study were explained. Physicians completed anonymous self-administered questionnaires during working hours in their workplace under the supervision of the medical students. Completing the questionnaire took an average of 15 minutes. The physicians were assured that the information provided would remain confidential and would be used only for the research purposes.

A current waterpipe smoker was defined as a physician who had smoked a waterpipe  $\geq 1$  time in the previous 30 days.

## Participants

A cross-sectional, anonymous, self-administered questionnaire was completed by Saudi Arabian physicians (medical doctors) who worked in 4 hospitals in Riyadh, Saudi Arabia (King Abdulaziz Medical City, King Fahad Medical City, King Khalid University Hospital, and Prince Sultan Military Medical City). We invited all male and female Saudi Arabian physicians from the 4 hospitals, covering 3 different specialties (medicine 52%, surgery

38% and family medicine 10%) and different levels of training and expertise (intern, resident, fellow, assistant consultant and consultant) to complete the questionnaire until we reached the target sample size.

The study protocol was approved by the Ethical Research Committee of King Abdullah International Medical Research Centre and all hospitals involved in the study.

## Data analysis

Data analysis was performed using SPSS statistical software. Sample characteristics were expressed as number (%) or mean and standard deviation. The relations between waterpipe smoking and demographic characteristics such as age, sex, medical profession level, and medical specialty were evaluated with chi-square and *t*-test. Differences in attitudes and health education about waterpipe smoking across smoker status were evaluated using the *t*-test for independent samples.

Multivariate logistic regression analysis was used to test for risk factors associated with waterpipe smoking. Statistical significance was defined as  $P \leq 0.05$ .

## Results

We approached around 600 Saudi Arabian physicians; 454 agreed to participate in the study and completed the questionnaires, a 75% response rate (age range 22–56 years). Characteristics of the participants, including speciality and training, are detailed in Table 1.

We found that 204 physicians (45%) were current waterpipe smokers (95% confidence interval 40–50). A significantly higher prevalence of waterpipe smoking was found among males than females (58% vs 18%,  $P \leq 0.001$ ). Waterpipe smoking was more common among physicians who were surgical specialists 58% compared with 38% among the medical specialists and 35% among

**Table 1. Characteristics of the study population\* and the relationship between waterpipe smoking and study population**

Characteristic	Total (n = 454)		Waterpipe smokers (n = 204)		Waterpipe non-smokers (n = 250)		P-value
	No.	%	No.	%	No.	%	
<b>Sex</b>							
Women	148	33	27	18	121	82	$\leq 0.001$
Men	306	67	177	58	129	42	
<b>Training level</b>							
Intern	110	24	53	48	57	52	NS
Resident	199	44	97	49	102	51	
Fellow, assistant consultant, consultant	145	32	54	37	91	63	
<b>Medical specialty</b>							
Medical	218	52	83	38	135	62	$\leq 0.001$
Surgical	160	38	93	58	67	42	
Family medicine	43	10	15	35	28	65	
<b>Mean (SD) age (years)</b>	<b>31 (7)</b>		<b>30 (6)</b>		<b>31 (8)</b>		<b>NS</b>

NS = not significant ( $P > 0.05$ ).

SD = standard deviation.

family medicine specialists ( $P = 0.001$ ) (Table 1). Most waterpipe smokers smoked at a coffee shop (41%), with some at home (27%) or in a restaurant (13%). Of the 204 physicians who were waterpipe smokers, 157 (77%) started smoking before age 24 years.

There were significant differences in attitudes and training between physicians who smoked and physicians who did not smoke waterpipes ( $P \leq 0.001$ ) (Table 2). Compared with waterpipe smokers, a greater frequency of waterpipe non-smokers agreed that waterpipe sales and advertising should be banned; waterpipes should be banned in restaurants, coffee shops, and all enclosed public places; physicians should have specific training about techniques of cessation of waterpipe smoking; and physicians are role models who should advise and give information to patients about quitting waterpipe smoking (Table 2).

In regard to education during training programmes, waterpipe smokers received less education about the dangers of waterpipe smoking, had less discussion about the reasons that people smoke waterpipe and less teaching about the importance of recording waterpipe

smoking history as a part of a patient's general medical history in comparison to waterpipe non-smokers ( $P \leq 0.001$ ) (Table 2). Half (50%) of the non-smokers received formal training on cessation approaches during their medical school or residency training programmes compared with 36% among waterpipe smokers,  $P \leq 0.003$  (Table 2).

Multivariate analysis showed there was a higher risk of waterpipe smoking in men than women [odds ratio (OR) = 4.6,  $P \leq 0.001$ ]; surgical than medical specialists (OR = 2.0,  $P \leq 0.001$ ); physicians who had negative than positive attitudes about banning waterpipe smoking in restaurants (OR = 3.9,  $P \leq 0.001$ ) and coffee shops (OR = 7.6,  $P \leq 0.001$ ); and those who stated that physicians do not have a role in giving information about smoking cessation to patients (OR = 2.5,  $P \leq 0.001$ ) (Table 3).

### Discussion

Our study provided insight about the prevalence and attitudes in regard to waterpipe smoking in Saudi Arabian physicians from 4 hospitals and different specialties in Riyadh, Saudi Arabia. We identified a high

**Table 2. Waterpipe smoking, attitudes, and training among (N = 454) Saudi physicians**

Response	Positive response				P-value
	Waterpipe smokers (n = 204)		Waterpipe non-smokers (n = 250)		
	No.	%	No.	%	
<b>Attitude</b>					
Waterpipe sales should be banned	109	53	211	85	$\leq 0.001$
Complete ban on the advertising of waterpipe products	141	70	225	90	$\leq 0.001$
Waterpipes should be banned in restaurants	113	55	233	93	$\leq 0.001$
Waterpipes should be banned in coffee shops	87	43	222	89	$\leq 0.001$
Waterpipes should be banned in all enclosed public places	149	73	230	92	$\leq 0.001$
Physicians should get specific training about techniques for cessation of waterpipe smoking	158	78	229	92	$\leq 0.001$
Physicians serve as role models for their patients and the public	123	60	198	79	$\leq 0.001$
Physicians should advise their patients who smoke waterpipes to quit	162	80	227	91	$\leq 0.001$
Physicians have a role in giving advice or information about waterpipe cessation	137	67	211	84	$\leq 0.001$
A patient's chances of quitting waterpipe smoking are increased if physicians advise him or her to quit	155	76	218	87	$\leq 0.003$
<b>Medical school curriculum or residency training</b>					
Were you taught in any of your classes about the dangers of waterpipe smoking?	108	53	173	70	$\leq 0.001$
Did you discuss in any of your classes the reasons why people smoke waterpipes?	84	41	141	57	$\leq 0.001$
Did you learn that it is important to record waterpipe smoking history as a part of the patient's general medical history?	132	65	198	80	$\leq 0.001$
Have you ever received any formal training in waterpipe smoking cessation approaches to use with patients?	73	36	123	50	$\leq 0.003$
Did you learn that it is important to provide educational materials to support waterpipe smoking cessation to patients who want to quit waterpipe smoking?	88	43	156	63	$\leq 0.001$

**Table 3. Multivariate logistic regression analysis for risk factors associated with waterpipe**

Variable	Odds ratio	95% confidence interval
Men vs women	4.6	2.59–8.25
Surgical vs medical specialty	2.0	1.21–3.43
Waterpipes should not be banned in restaurants	3.9	1.61–3.43
Waterpipes should not be banned in coffee shops	7.6	3.28–3.43
Waterpipes should not be banned in all enclosed public places	0.2	0.08–0.64
Physicians do not have a role in giving information about waterpipe smoking cessation to patients	2.5	1.41–4.49

prevalence of waterpipe smoking among the physicians (45%). Predictors of waterpipe smoking in our study were younger age, male sex and surgical specialty. Most of our participants started waterpipe smoking at high school or medical school age.

Although the data on waterpipe smoking in the Saudi Arabian population are limited, a pilot study among secondary school students in Al Hassa region showed a prevalence rate of 37% (6). The reported prevalence of current cigarette smoking among adults in Saudi Arabia ranges from 11.6% to 52.3% (7). Cigarette smoking among physicians and healthcare providers in Saudi Arabia has been studied previously. More recently, in southwestern Saudi Arabia 18.3% physicians were smokers, and the highest prevalence of smoking was seen among hospital residents (25.3%), primary health care physicians (20.5%) and hospital consultants (18.6%) (8). In neighbouring countries, the frequency of tobacco smoking among physicians was 11% in Oman (9), 56% in Jordan (10) and 41% in Turkey (11). Waterpipe smoking is common in other Middle East countries: in a Syrian study, 25% of male students used waterpipes (12). In Lebanon, 21% of university students reported current waterpipe smoking (13). The introduction of flavoured tobacco, the thriving coffee shop culture and the lack of regulations have been cited as the main factors contributing for the spread of waterpipe smoking globally (14). The Global Youth Tobacco Survey Collaborative Group estimated that 10–18% of adolescents aged 13–15 years use tobacco products other than cigarettes, mostly in the Eastern Mediterranean region (15).

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The high prevalence of waterpipe smoking among Saudi Arabian physicians (45%) is of concern because physicians are considered role models for their patients and the community in fighting tobacco consumption and promoting smoking cessation. There are several potential explanations for the high prevalence, including the high stress of a medical career and the misconception that waterpipe smoking relieves stress. Moreover, there is a belief that waterpipe smoking is less harmful than cigarette smoking (16,17); other factors include curiosity and social trends as main reasons for waterpipe smoking (18). However, the low exposure to education related to waterpipe hazards and cessation in medical school or postgraduate training is probably the main contributing factor for the high frequency of waterpipe smoking among physicians. In our study, most physicians started waterpipe smoking at age under 24 years, and this is consistent with previous findings that most waterpipe smokers start smoking in adolescence (19). Waterpipe smoking is more prevalent in junior physicians (interns and residents) because these physicians are under severe stress and have very busy schedules. Our study showed a significantly higher prevalence of waterpipe smoking among men than women; this may be true, however it may be a result of underreporting by women because there is a social stigma associated with waterpipe smoking in women.

Limitations of the present study included the cross-sectional design, which may have introduced bias from self-reporting. In addition, the study was limited to only one form of tobacco smoking. Nevertheless, the study had certain strengths: it was a multicentre study involving all levels of physicians with varying expertise and specialties.

There is a need to implement strategies to reduce waterpipe smoking among physicians, which should have the additional benefit of reducing waterpipe smoking in the general population. These strategies could include classes, training and educational materials about the health risks and cessation in medical schools and residency training programmes.

In conclusion, waterpipe smoking in Saudi Arabian physicians has high prevalence, especially in men, junior physicians, surgeons and physicians who did not receive formal education about waterpipe smoking in their training. This may result in a negative image of physicians because patients regard their physician as a model for health education and disease prevention.

## Prévalence de la consommation de pipe à eau et attitudes à cet égard parmi les médecins en Arabie saoudite

### Résumé

**Contexte :** Le tabagisme tue plus de 5 millions de personnes par an et constitue la cause la plus importante de décès évitables. La consommation de pipe à eau est courante au Moyen-Orient et elle est prévalente chez les jeunes. Selon une idée reçue, elle serait moins dangereuse que la consommation de cigarettes. Les médecins sont considérés comme des modèles à suivre dans la communauté et leurs comportements et attitudes vis-à-vis du tabagisme peuvent avoir un impact direct sur le sevrage.

**Objectif :** La présente étude vise à estimer la prévalence actuelle, les attitudes et les facteurs associés à la consommation de pipe à eau parmi les médecins en Arabie saoudite.

**Méthodes :** En recourant à un questionnaire auto-administré, nous avons réalisé une étude transversale auprès de 454 médecins hommes et femmes de trois spécialités et de différents niveaux de formation, travaillant dans quatre hôpitaux de Riyadh.

**Résultats :** La prévalence de la pipe à eau s'élevait à 45 % ; elle était supérieure chez les hommes que chez les femmes (58 % contre 18 % ;  $p \leq 0,001$ ) et chez les chirurgiens que chez les médecins (58 % contre 38 % ;  $p \leq 0,001$ ). Davantage de non-fumeurs que de fumeurs pensaient que les médecins devaient jouer un rôle de modèle (79 % contre 60 % ;  $p \leq 0,001$ ). Les médecins qui ne fumaient pas la pipe à eau avaient suivi une formation plus formelle sur le sevrage tabagique que ceux qui la fumaient (50 % contre 36 % ;  $p \leq 0,001$ ).

**Conclusions :** La consommation de pipe à eau chez les médecins saoudiens est fréquente et elle est associée à une faible exposition à l'information sur les risques et le sevrage tabagique durant la formation médicale.

### انتشار تدخين الشيشة في أوساط الأطباء السعوديين ومواقفهم إزاءه

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#### الخلاصة

الخلفية: يؤدي تدخين التبغ بحياة أكثر من 5 ملايين شخص سنوياً ويعد أهم سبب للوفاة التي يمكن الوقاية منها. ويشيع تدخين الشيشة في الشرق الأوسط وينتشر في صفوف الشباب. وثمة تصور خاطئ بأن تدخين الشيشة أقل ضرراً من تدخين السجائر. ويعتبر الأطباء قدوة في مجتمعهم ومن شأن سلوكياتهم ومواقفهم من التدخين أن تؤثر تأثيراً مباشراً على الإقلاع عنه.

الهدف: تمثل الهدف من هذه الدراسة في تقدير مستوى الانتشار الحالي لتدخين الشيشة بين أطباء المملكة العربية السعودية والمواقف المتخذة حياله والعوامل المرتبطة به.

طرق البحث: أجرينا دراسة مقطعية، باستخدام استبيان يجاب عليه ذاتياً، لـ 454 طبيباً وطبيبة من 3 تخصصات، لديهم مستويات تدريب مختلفة ويعملون في 4 مستشفيات في الرياض.

النتائج: بلغ انتشار تدخين الشيشة 45٪، وسجل ارتفاعاً في صفوف الرجال مقارنة بالنساء (58٪ مقابل 18٪؛  $P \geq 0,001$ )، وفي صفوف الأطباء الجراحين أكثر من أطباء الباطنة (58٪ مقابل 38٪؛  $P \geq 0,001$ ). وتبين أن عدداً أكبر من غير المدخنين مقارنة بالمدخنين يرون أن الأطباء ينبغي أن يكونوا قدوة (79٪ مقابل 60٪؛  $P \geq 0,001$ ). كما تبين أن الأطباء غير المدخنين للشيشة سبق أن تلقوا تدريباً رسمياً بشأن الإقلاع عن التدخين مقارنة بالأطباء المدخنين (50٪ مقابل 36٪؛  $P \geq 0,001$ ).

الاستنتاجات: ينتشر تدخين الشيشة في صفوف الأطباء السعوديين ويرتبط بانخفاض مستوى التعرض لمعلومات بشأن مخاطره والإقلاع عنه أثناء التدريب الطبي الذي يتلقونه.

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