ABSTRACT

Background: Waterpipe smoking is a method of tobacco consumption that continues to spread globally. In 2002, a ban of tobacco sales was adopted in the Saudi Arabian cities of Mecca and Medina.

Aims: This study aimed to examine prevalence of waterpipe and cigarette smoking among students of Taibah University, the biggest university in Medina city where tobacco sales ban is implemented.

Methods: A structured questionnaire was used to achieve the aims of the study.

Results: The study showed that prevalence of current and ever waterpipe use was 24.2% and 36.04%, respectively, while for current and ever use of cigarette smoking it was 31.9% and 42.7%, respectively. This prevalence is similar to that reported by studies conducted in other Saudi cities where tobacco sales are allowed. Multivariate analysis showed that waterpipe use was higher among senior students, those with monthly household income between 5000-9000SR, those with pocket money spending of more than 500SR/month, and if number of individuals living at the household is 5 or more. On the other hand, current cigarette smoking was higher in those of more than 22 years, among male students, in those with pocket money...
spending of more than 500 SR/month and those who lived away from their parents.

Conclusions: Collectively, waterpipe and cigarette smoking, despite ban on tobacco sales, are still common among Taibah University students in Medina/Saudi-Arabia.

Keywords: shisha, tobacco, smoking, hookah, Taibah

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Introduction

Globally, approximately 6 million deaths each year are attributed to tobacco smoking (1). In addition to cigarette smoking, waterpipe tobacco smoking has become more popular (2) particularly among high school and university students (3). This growth in popularity is due, in part, to the misperception that the waterpipe ‘filters’ the smoke, rendering it less harmful than other types of tobacco smoking (4). In fact, waterpipe tobacco smoke contains carcinogens such as polycyclic aromatic hydrocarbons that cause lung tumours, toxic aldehyde compounds that cause lung inflammation, high levels of carbon monoxide that contribute to cardiovascular disease, and nicotine that causes addiction (5–8). Animal studies have shown that waterpipe smoke exposure leads to lung inflammation, oxidative stress, impaired pregnancy outcomes, renal functions, chromosomal structure, and cognitive and mental ability (9–14). Thus, this type of smoking has the potential to cause cancer, lung disease, cardiopulmonary disease, dependence, and other disorders. (9,15–18). For these reasons, waterpipe tobacco smoking is now seen as a public health threat requiring effective policy intervention (19,20).

One potential intervention is to ban tobacco sales, and this approach was adopted in the Saudi Arabian cites of Mecca and Medina in 2002 (21). This is a total ban that throughout the whole
city including Taibah University (where the current study was conducted), and all forms of
tobacco including cigarettes, cigars, Jurak, and waterpipe tobacco (waterpipe cafés are also
banned, as is the sale of paraphernalia used in waterpipe tobacco smoking). Traders who
violate the ban are compelled to pay a fine between SR 5000 to SR 10 000 (SR1 = US$ 0.37),
and their stores could be closed if they are cited for a third violation (22). Tobacco consumption
is common in Saudi Arabia, where studies indicate that, among high school children, the
prevalence of all types of tobacco smoking was 30.3% in boys and 8.5% in girls, where
waterpipe smoking represented 53.9% (both genders) of current tobacco users (23). Similar
prevalence was reported among college (24) and medical and dental students (25–29).

The purpose of this study is to examine the prevalence and demographic and environmental
factors associated with cigarette and waterpipe tobacco smoking among students of Taibah
University, the biggest university in Medina city. Taibah University is a government university in
Saudi Arabia that has more than 69 000 students and offers both undergraduate and graduate
programmes in most fields including basic sciences, medical sciences, engineering and
humanities. As of 2014, the city of Medina has a population of approximately 1.5 million (30).
The size of the city is approximately 589 square kilometres located in the western part of Saudi
Arabia.

Methods

Subjects

Students from Taibah University, Medina, Saudi Arabia were recruited to participate in the
study. To be eligible to participate, subjects had to be at least 18 years old and enrolled as
students in Taibah University. The study was conducted between February and April 2015. The
study procedures were approved by the research and ethical committees of Taibah University.

Recruitment

Participation was voluntary and participants were selected randomly using a two-stage cluster
sampling strategy as previously described (31). In brief, Taibah University’s main campus
regions were identified in both the male and the female branches. The regions were allocated
numbers and three regions from each branch were randomly selected using fish bowl drawing
method. Recruitment was facilitated by gender-specific staff from each region occurred during
the working days of a given week from 10:00 to 15:00. During sampling time, every fourth
student to enter the selected region was invited to be part of the study. Approximately 1700
(1200 males and 500 females) students were invited to participate in the study. Of those, 793
male students (66%) and 274 female students (35%) completed the anonymous survey.

The instrument and measures
The survey instrument (in Arabic) was constructed based on that used previously in Jordan (32). The instrument was modified to accommodate differences in spoken Arabic between Jordan and Saudi Arabia. To make sure that the instrument was suitable for the population, it was pilot tested in the university with 50 students and was modified according to their comments.

Among the measures was cigarettes and/or waterpipe smoking, where students were asked to report if they have smoked tobacco using waterpipe and/or cigarette, even a puff, in the past 30 days (current users) and ever. Demographic measures such as student specialty, age, university level, sex, paternal education, monthly household income, and pocket money spent were also obtained. For student specialty, participants were asked to select from: basic sciences, medical sciences, engineering and humanities. For paternal education, we asked participants to select from: did not complete high school, completed high school, and completed college or higher degrees. For monthly household income, we asked the student to select from the followings: SR 0–5000, SR 5001–9000, and SR 9001 or more. The survey also contained items asking whether participants lived in a city (vs. village) and whether or not they lived with parents.

Data Analysis

The SPSS software (Version 21) was used for statistical analysis. Chi-square statistical test was used to determine significant differences in prevalence of cigarette and waterpipe tobacco use across sociodemographic variables. The multivariable logistic regression method was used to determine the independent association between different variables. P < 0.05 was considered significant.

Results

Of the 1700 invited participants, 1067 returned the questionnaire (62.8%). Of the final sample, 74.3% were male. The age range was 18–29 with the majority between 21 and 25 years (63%), 46% of the participants were from college of basic sciences followed by humanities (19%). The sample was evenly distributed across different university years. The majority of participants lived in the city (92.4%) and with their parents (89.6%), and 41% reported monthly household income of less than SR 5000. Approximately half of participants spent more than SR 1000 per month from pocket money.

The prevalence of current and ever waterpipe use was 24.2% and 36.04% respectively, while for current and ever use of cigarette smoking it was 31.9% and 42.7% respectively. In bivariate analyses (Table 1), waterpipe tobacco use was associated with university level (P < 0.001), age (P < 0.01), monthly household income (P < 0.001), number of others living in the home (P <
0.001) and living away from parents (P < 0.01). However, current cigarette use was associated
with university level and specialty (P < 0.01), age (P < 0.001), gender (P < 0.005), monthly
household income (P < 0.001), pocket money spent monthly (P < 0.001) and living away from
parents (P < 0.01).

In multivariate analysis (Table 2), odds of waterpipe use was reported to be lower among
engineering students and to be higher among 6th year students, those with monthly household
income from SR 5000–9000, those with pocket money spending of more than SR 500 per
month, and those with number of individuals living at home of ≥ 5. However, odds of current
cigarette smoking was reported to be higher in students ≥ 22 years of age, and among male
students, in those with pocket money spending > SR 500 per month and those who lived away
from parents.

Discussion

The results of this study showed that tobacco use is common among university students in
Medina, Saudi Arabia, where sale of tobacco products is banned. The number of current
waterpipe smokers did not differ relative to that of cigarette smokers. In addition, as described
below, the prevalence of tobacco use among students of Taibah University is similar to that
reported in other universities in the country, indicating the ineffectiveness of banning tobacco
products in the city in reducing tobacco use among students.

Several reports have examined the prevalence of tobacco use in Saudi Arabia. A survey that
involved 10 735 individuals aged ≥ 15 years (5253 men and 5482 women) from Saudi Arabia,
which was performed during 2013, showed that current cigarette smoking was 12.2% while
daily waterpipe smoking was reported by 4.3% of the population (7.3% of men and 1.3% of
women) (33). A study that was conducted on dental students at King Saud University in Riyadh
showed that the current prevalence of all forms of tobacco smokers was 27.6% in male students
and 2.4% in female students (26). The study also showed that most smokers used waterpipe
only (51.5%), followed by both waterpipe and cigarettes (25%), or cigarettes only (23.5%).
Another study by Koura et al. (34) conducted with college female students in Dammam area
showed that current smoking was 8.6% among which 43.2% were waterpipe smokers. In
addition, waterpipe smoking was reported to reach 37% among healthcare university students
in Saudi Arabia (35) and 36% among dental practitioners in Medina area (36).

Among secondary school children in Riyadh current smoking was reported by 28.6% of the
students (24). Similar numbers were reported among schoolchildren at Riyadh and Al-Hassa
regions of Saudi Arabia (23). A previous study in another Saudi city before the Medina city ban
reported a prevalence for current tobacco smoking of 25.3% (37). In the current study,
waterpipe use was 24.2% and for cigarette smoking 31.9%. Thus, even when selling tobacco products is prohibited in Medina city, prevalence of cigarette and waterpipe tobacco smoking is not lower (even higher in several instances) relative to rates reported in other Saudi regions. Importantly, according to the law, the ban is restricted to selling tobacco products; however, no fines are imposed on individuals who smoke inside the city. An assessment done in Mecca 2008 showed that only 75% of stores complied with the no sale ban (38), while no such evaluation was carried out in Medina. In addition waterpipe and cigarette smokers may bring their products with them and may also smuggle them in for others.

In Bhutan, where also a similar experience of banning tobacco sales was imposed in 2004, 63% of those surveyed as part of international tobacco control (ITC) study reported purchasing their cigarettes from Bhutan with sales taking place in a concealed manner, a lack of proper enforcement and availability of smuggled products (39). However, in Bhutan other stringent tobacco control measures such as bans on smoking in all indoor areas as well as outdoor public places, bans on advertising and promotions, and increased taxation on cigarettes imported for personal use were in place. In fact, the rate of current tobacco use in Bhutan in 2014 according to a STEP wise survey was 25% (40). To date, in line with the implementation of the WHO Framework Convention of Tobacco Control (FCTC), which is an international binding public health treaty on tobacco control, more comprehensive tobacco control policies have been evaluated globally and have repeatedly shown to be successful in decreasing smoking rates. These policies included bans on smoking indoors with penalties for violation, bans on promotion and advertising, as well as larger pictorial warnings on all tobacco products. More in depth evaluations of tobacco sales bans, such as that of the Mecca and Medina and Bhutan experiences, are needed to build evidence and further shed light on the effectiveness of this policy in decreasing tobacco consumption as a stand-alone policy, independent of other tobacco control policies.

The current findings showed that waterpipe and cigarette tobacco use was associated with university level, age, monthly household income, number of others living in the home and living away from parents. However, gender is associated only with cigarette smoking but not with waterpipe use, indicating social acceptance of waterpipe use among females in the region (41). Gender and age were found to be associated with smoking among Saudi smokers (33). Having smoker friends and being male are the highest risk factors for tobacco use among dental students at King Saud University in Riyadh (26). As for female smoking behaviour, having a family member smoker is the main factor associated with smoking among female students in Dammam city (34). A report by Amin et al. 2010 (23) showed that gender, age and having relatives and friends as smokers are among the major factors associated with waterpipe smoking. In other countries in the region, gender, income, living away from parents and having relatives/friends as smokers are among risk factors of waterpipe/cigarette smoking (3,31,32,42–44). Thus, risk factors for tobacco use are shared among university students in Taibah University and other local and regional universities.
Conclusion

Collectively, results of the current study indicate that waterpipe and cigarettes smoking are common among student at Taibah University in Medina, Saudi Arabia, irrespective of the ban on tobacco product sales in that area. However, the mentioned results certainly advocate implementation more comprehensive tobacco control measures such as smoke-free environments, increased taxation of tobacco products, bans of advertisement, promotion and sponsorship as well as larger pictorial health warnings in line with FCTC as well as WHO MPOWER measures. Future studies that compare prevalence of tobacco use in Medina and Mecca to the prevalence of tobacco use in other Saudi cities (where tobacco sales are not banned) are recommended to shed light on the effectiveness of such bans.

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