

Smoking among health science university students in Riyadh, Saudi Arabia

Mirza M. Subhan, PhD,

Thamir Al-Khlaiwi, PhD,

Suleiman O. Ghandourah, MBBS.

Tobacco use is currently responsible for the death of one in 10 adults around the world, and has been predicted to cause the deaths of 10 million per year by 2020. The consequences of smoking on an individual and the economic burden on a nation are now well known. King Saud University (KSU) is Saudi Arabia's largest and most prestigious university. The total number of students registered in 2008 was over 40,000. Over the last 2 decades, published studies on smoking prevalence in KSU students have shown a decreasing trend.¹⁻⁵ Conversely, the use of shisha (hubble-bubble) appears to be increasing.^{2,4,5} Chaouachi⁶ has given a detailed description of shisha smoking, and what its health consequences are (in comparison with smoking). Another major concern is that these studies have examined smoking prevalence primarily in males. Female data on variables such as, their smoking consumption, and type of tobacco use is poorly available. Although smoking prevalence in KSU students seems to be decreasing, the use of shisha may be increasing. The objective of this study was to assess the prevalence of cigarette and shisha smoking in Saudi university health science students, and some variables that might be associated with the prevalence of smoking.

This was a descriptive, cross-sectional study, carried out on 1074 female and male KSU students from the Colleges of Medicine, Dentistry, Pharmacy, and Applied Medical Sciences, and 44 female nursing students from the National Guard Hospital, Riyadh, Kingdom of Saudi Arabia. In 2006 and 2007, a self-administered, anonymous questionnaire was distributed to all students enrolled in KSU Physiology teaching programmes. The Research Ethics Committee, College of Medicine, KSU, approved the study. The questionnaire was developed to assess anthropometry and prevalence of smoking. The questionnaire was developed by reviewing the literature and making modifications according to local needs, and was written in Arabic. The questionnaire was pilot tested on approximately 30 KSU staff members. Students voluntarily and anonymously filled in the questionnaire on the spot, and handed it back to the instructor. After completion, one translator translated the questionnaires' comments into English for analysis. The variables studied were: age, gender, height, weight,

body mass index (BMI), self-perceptions of health (poor or good), and tobacco smoking (frequency, since when they smoked, type, and consumption). Daily smokers were defined as those who smoked any type of tobacco daily, and occasional smokers as those who smoked less frequently. In this study, smoking was defined as a combination of daily and occasional smokers. The data were analyzed by SPSS version 15.0, and Epistat was used to calculate odds ratios (OR) with 95% confidence intervals (CI). The Pearson's chi squared (χ^2) and Fisher's exact tests were used to determine statistically significant associations in categorical variables, between male and female students. For quantitative variables, an unpaired t-test was used. Logistic regression was used by considering smoking as the dependent variable, and with gender, BMI, and self-perceived health as independent variables in the model. The significance level was set at 0.05.

Out of 1118 students who were provided the questionnaire, 941 (84%) responded. Of those, 605 (89%) males and 305 (69%) females completed the questionnaire fully, and 31 (3%) did not, thus, their questionnaires were excluded from the analyses. The mean age of all respondents was 20.1 ± 1.2 years. It ranged from 18-37 years, with the majority (99.8%) between 18-25 years. The mean value for BMI was 23.2 ± 4.7 kg/m², and it ranged from 13.9 - 43.8 kg/m². Age, height, weight, and BMI were all significantly greater in males compared to females ($p=0.0001$).

Prevalence of smoking. The prevalence of smoking in 910 students was 11.1%. It was significantly higher ($p=0.0000016$) in males (14.7%; 89 smokers) than females (3.9%; 12 smokers). The OR of smoking (to not smoking) in males, compared to females was 4.21 (95% CI, 2.20-8.24). In males, there were no significant differences between students of Dentistry, Pharmacy, first and second year Medicine. Nursing students had a significantly higher prevalence of smoking than other female students ($p=0.045$).

Type of tobacco used by smokers. Of the 101 smokers in this study, 62 (6.8% of the total study population) used cigarettes only, 30 (3.3% of the total study population) shisha only, and 9 (1%) used both (Table 1). In males, 56 (9.3%) used cigarettes only, 24 (4%) shisha only, and 9 (1.5%) used both. In females, 6 (2%) used cigarettes only, and 6 (2%) shisha only. There were no significant differences in the way male and female students smoked tobacco. However, when analyzing only shisha use against other tobacco preferences in daily smokers, females used shisha more than males ($p=0.044$).

Table 1 - Number and prevalence of cigarette and shisha use in all male and female smokers (N=910).

Variables	Male n=605 n (%)	Female n=305 n (%)	Total n(%)
Cigarette smokers	56 (9.3)	6 (2.0)	62 (6.8)
Shisha smokers	24 (4.0)	6 (2.0)	30 (3.3)
Cigarette and shisha smokers	9 (1.5)	0 (0)	9 (1.0)
Total	89 (14.7)	12 (3.9)	101 (11.1)

Daily tobacco consumption. Males smoked a mean of 13.6 ± 10.8 cigarettes/day (95% CI; 10.9-16.2), while females smoked a mean 10.5 ± 24.3 cigarettes/day (95% CI; -14.9-36). The mean number of times shisha was consumed every day by smokers was 0.4 ± 0.5 (95% CI; 0.26-0.57).

Smoking duration. There was no significant difference ($p=0.44$) between the number of years of smoking in males (2.7 ± 1.6 years) and females (4.0 ± 1.4 years). Logistic regression analysis was performed by considering smoking as the dependent variable and gender, BMI, and self-perceived health as independent variables: there were no significant findings.

The major findings in this study are that, approximately a tenth of all respondents were smokers, and this was more in males than females. More than one-third of all smokers used shisha, surprisingly this was one-half in female smokers. The response rate for males in the present study was close to that found in previous studies in KSU students.^{1,4} The female rate was slightly lower than that previously reported, 78% in one study, and 75% in another.^{3,5}

Various studies have reported the prevalence of smoking in students at KSU. The proportion of male smokers among medical college students and students in other colleges has ranged from 33-40% in studies published from 1987-1992.^{1,2} More recent data has shown that smoking prevalence in male KSU students has fallen to 13%.⁴ In 1993, Felimban³ reported a smoking prevalence in female KSU medical students of 2% and science students of 5%.³ In 2008, a study in female KSU medical students revealed a prevalence of smoking of 2.4%.⁵ Both these studies defined smokers as smoking daily. The rate of daily male and female smoking in the present study is lower than any previously reported. This can either be interpreted as a realistic fall, and a success of government policies to reduce smoking in youth, or alternatively it could be an underestimation. Efforts by the government have included banning smoking in public places, plans to make smokers pay increased health premiums, and

vigorous anti-smoking campaigns in schools and offices, including lectures in women's groups.

The present study has shown that males had a significantly greater prevalence of smoking than females. In the present study, females who smoked daily had more than twice the cigarette consumption of males. This was due to the fact that there were only 2 daily female cigarette smokers, of whom one reported smoking 60 cigarettes per day, and the other 3 per day. In our study, more than one-third of male smokers used shisha, or shisha and cigarettes. Alarmingly, this was one-half in female smokers. Data from 1992 showed 16% of all daily smokers used shisha and other tobacco products (excluding cigarettes).² A study a year later, also in males, reported 68% of daily and ex-smokers used shisha, or shisha and cigarettes.⁴ In 2008, a study in females showed 70% of daily smokers smoked shisha.⁵ These 2 recent studies have therefore actually shown that in KSU male students and female students, there are more shisha than cigarette smokers. More precise data is needed on this issue, especially as the dangers of shisha smoking are becoming more apparent and prevalences are rising.⁶ Several studies have shown that Saudi students feel finance is not an issue in smoking.^{1,2} Currently, all Saudi health science students receive an allowance of around 1,000 Saudi riyals (US\$ 267) per month, and have no fees to pay. The purchasing power of Saudi nationals has increased, and this is associated with cigarette consumption. Even though tobacco prices have risen in the Gulf region, the present authors' opinions are that these should be further increased, because of the higher spending power. Taxes should be increased on all tobacco brands, local and international, otherwise, smokers will substitute to cheaper brands, or products.

Currently, Saudi customs duties on cigarettes are 100%, however, imports from Bahrain, Kuwait, Oman, Qatar, and the United Arab Emirates are duty free. Health professionals should not get complacent with the lower figures found in this study as shisha smoking prevalence was found to be relatively high, and this implies more aggressive alternative strategies are needed to halt the levels of tobacco use in youths. Smoke-free areas have to be strictly enforced, and tobacco prevention programs should be a priority in young adults. Reducing tobacco use will not only decrease the global burden of disease but also, improve the general health and output of all nations. Another concern raised by the present study is that these students will graduate into doctors, dentists, pharmacists, and allied medical staff, and theoretically, health workers should be acting as a role model of good health for others, which would be difficult if they are smokers themselves.

In conclusion, approximately one-tenth of all respondents in this study were smokers, and this was more in males than females. More alarmingly, almost a third of all smokers used shisha, while in females one-half of them used shisha. Although shisha consumers smoked more occasionally than cigarette smokers, it is as harmful as cigarette smoking, and seems to be gaining popularity in university students.

Acknowledgment. *The authors gratefully acknowledge Dr. S. Ahmed and Mr. A. A. Marzouk (for the statistical guidance), and Dr. S. Bannat (helped distribute and collect the questionnaires among female students), King Saud University, Kingdom of Saudi Arabia. Many thanks also to Professor R. R. Hamadeh of the Arabian Gulf University, Bahrain, for the critical review of the manuscript.*

Received 20th July 2009. Accepted 28th September 2009.

From the Department of Physiology, College of Medicine, King Saud University, Riyadh, Kingdom of Saudi Arabia. Address correspondence and reprint requests to: Assistant Professor Mirza M. Subhan, Department of Physiology, College of Medicine and Medical Sciences, Arabian Gulf University, PO Box 22979, Kingdom of Bahrain. Tel. +973 17239887. Fax. +973 17271090. E-mail: drfeisal@hotmail.com

References

1. Bener A. Smoking habits among male students at King Saud University. *J R Soc Health* 1987; 107: 28-30.
2. Jarallah JS. Smoking habits of medical students at King Saud University, Riyadh. *Saudi Med J* 1992; 13: 510-513.
3. Felimban FM. The smoking practices and attitudes towards smoking of female university students in Riyadh. *Saudi Med J* 1993; 14: 220-224.
4. Al-Turki YA. Smoking habits among medical students in Central Saudi Arabia. *Saudi Med J* 2006; 27: 700-703.
5. Al-Turki YA, Al-Rowais NA. Prevalence of smoking among female medical students in the College of Medicine, Riyadh, Saudi Arabia. *Saudi Med J* 2008; 29: 311-312.
6. Chaouachi K. Hookah (Shisha, Narghile) Smoking and Environmental Tobacco Smoke (ETS). A critical review of the relevant literature and the public health consequences. *Int J Environ Res Public Health* 2009; 6: 798-843.

Copyright

Whenever a manuscript contains material (tables, figures, etc.) which is protected by copyright (previously published), it is the obligation of the author to obtain written permission from the holder of the copyright (usually the publisher) to reproduce the material in Saudi Medical Journal. This also applies if the material is the authors own work. Please submit copies of the material from the source in which it was first published.