

Smoking habits among Saudi female university students: prevalence, influencing factors and risk awareness

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Smoking is a recognized health problem worldwide.¹ Smokers are at an increased risk of developing several serious and potentially fatal diseases such as heart disease, cancer and respiratory illness.² Women who smoke also experience gender-specific health consequences, including various adverse reproductive outcomes.³ The prevalence of smoking among women is consistently lower than men, especially in developing countries where there is a strong influence of culture and tradition.⁴ The situation, however, is changing and the epidemic of smoking among women in the developing world is increasing.⁵

Eastern Mediterranean countries, including Saudi Arabia, follow the same global trend of gender differences in smoking patterns.^{6,7} Several studies conducted over the past 20 years showed that the tobacco epidemic is firmly established in the Kingdom of Saudi Arabia.^{8,9,10} However, most of studies were conducted in males, limited to cigarette smoking and confined to the central region.

The aims of this study were to assess the prevalence and patterns of smoking among Saudi female students at King Abdulaziz University in Jeddah city, Western Region and to determine factors influencing student smoking behavior and their knowledge about its adverse health effects.

METHODS

This was a cross-sectional study conducted by distributing a self-administered questionnaire to a sample of 1100 female students attending the colleges of Medicine, Dentistry and Arts and Science. The questionnaire was a modification of the Arabic version of the Global Health Professionals Survey and the Global Youth Tobacco Survey core questionnaire.^{7,11} The questionnaire was designed to gather data on demographics, prevalence of tobacco use, smoking-related knowledge

and attitudes, smoking cessation, exposure to second hand smoke and knowledge about health effects of tobacco use.

The questionnaire was distributed to the students by one of the researchers, who explained the purpose of the study and content of the questionnaire. Anonymity of participants was emphasized, therefore no name or student serial number was requested. Confidentiality was strictly maintained with all completed questionnaires.

All data management and analysis was done using the SPSS statistical program (version 10). The percentage of smokers among different demographic groups was compared using Chi-square test. A logistic regression analysis was used to examine the independent effect of variables that were significant in the bivariate analysis controlling for age.

RESULTS

A total of 1050 students completed and returned the questionnaire (95.5% response rate). Approximately 20% of the respondents were dental students, 36% medical students and 44% arts and science students. Ages ranged between 18 to 26 years.

The prevalence of smoking in relation to demographic characteristics of the study sample is displayed in Table 1. Among respondents, 11% were current smokers. Among the smokers, 5% were cigarettes smokers, 8.7% were users of the water pipe (i.e. museal, shisha) and other tobacco products and 2.7% were smokers of both cigarettes and other tobacco products. When comparing the prevalence of smoking based on college, age or GPA (grade point average) no statistically significant differences were found, whereas a significantly higher smoking prevalence was associated with a higher family income level ($P < 0.05$), although it did not retain its significance in the multivariate logistic regression.

Smokers were significantly more likely to have a parent or a friend who smokes. Multivariate logistic regression analysis showed that having a parent or a friend who smoke was independently associated with smoking. Students who had a close friend or a parent who smokes were respectively, 5 (OR= 5.2; $P<0.01$) and 2 (OR= 2.3; $P<0.01$) times, more likely to be smokers independent of age and level of income.

Knowledge about smoking hazards among students is presented in Table 2. Regarding smoking in general, the majority of students (95.4%) were aware of the habit being hazardous to their health. A higher percentage of smokers (12%) than nonsmokers (2.7%) thought smoking was not hazardous to their health ($P<0.001$). Regarding smoking other forms of tobacco (including shisha and museal), 22% of students thought they were less harmful than cigarettes and the difference between smokers (37%) and nonsmokers (21%) was also significant ($P<0.001$).

Knowledge about the association between smoking and adverse health effects varied among respondents (Table 2). For instance, more than 90% of students were aware of the association between smoking and heart disease, yet only 75% were aware of its association with stroke. There was no statistically significant difference between smokers and nonsmokers in their knowledge about the health consequences of smoking, except for hypertension. However, there were statistically significant differences between students from different colleges in their knowledge about the adverse health effects of smoking.

DISCUSSION

This was a cross-sectional study conducted to determine the spread of the tobacco epidemic among female university students in Jeddah in the Western Region of Saudi Arabia. In our study, 11% of students were current tobacco users, which is consistent with several international studies.^{6,12} The results are also consistent with a study conducted on female college students in Saudi Arabia in which a prevalence of 8.3% was reported.¹⁰

Water pipe and forms of tobacco other than cigarettes were the most commonly used (8.7%) among our study population. There is growing evidence that tobacco use other than cigarettes is spreading across all world regions.^{6,7} In the Eastern Mediterranean Region, water pipe smoking is enjoying a great rise in popularity and becoming a behavioral norm, especially for women.¹³ There is a paucity of epidemiological data regarding water pipe use in Saudi Arabia. A recent study in male medical college students in Riyadh showed a

Table 1. Prevalence of tobacco use according to demographic characteristics of the study sample

| Demographic Data | Number (N)* | Percentage (%) | Smoking Prevalence (%) |
|---------------------|-------------|----------------|------------------------|
| Total sample | 1050 | 100 | 11 |
| Age | | | |
| < 20 | 519 | 49.4 | 11.4 |
| 21-23 | 482 | 45.9 | 9.8 |
| > 24 | 49 | 4.7 | 18.4 |
| College | | | |
| Medicine | 379 | 36.1 | 8.5 |
| Dentistry | 205 | 19.6 | 11.7 |
| Arts & Science | 464 | 44.3 | 12.7 |
| GPA | | | |
| Excellent | 266 | 25.6 | 11.7 |
| Very good | 492 | 47.4 | 10 |
| Good | 231 | 22.3 | 10.4 |
| Satisfactory | 49 | 4.7 | 20.4 |
| Income† | | | |
| < 5000 | 230 | 23.3 | 8.7 |
| 5000- 10,000 | 209 | 21.2 | 9.1 |
| 10,000- 20,000 | 286 | 29 | 10.8 |
| > 20,000 | 261 | 26.5 | 16.5 |
| Parents‡ | | | |
| Smokers | 377 | 36.2 | 17 [§] |
| Non-smokers | 665 | 63.8 | 7.5 |
| Friends‡ | | | |
| Smokers | 231 | 22.1 | 28.1 [§] |
| Non-smokers | 812 | 77.9 | 6 |

*Numbers do not add up due to missing data † $P<0.05$ ‡ $P<0.001$

higher proportion of water pipe users 44% than cigarette users 32.3% among smokers.⁸

Water pipe smoking is perceived by many as being less dangerous than cigarettes.^{13,14} The same misconception was found in our study, where 23% of students and 37% of smokers thought other forms of tobacco use (including water pipe) were less harmful than cigarettes. Although data regarding the content hazard and health effects of water pipe use is not well established, there is growing evidence of the adverse health consequences of water pipe use, pointing towards it being as harmful as cigarettes if not even more.¹³ This calls for

Table 2. Knowledge of smoking adverse health effects among students

| Smoking Hazards | % of students unaware of smoking adverse health effects | | | | |
|--|---|----------------|-------------|------------------|----------------|
| | Total Sample | Smoking Status | | College | |
| | | Smokers | Non-smokers | Medical & Dental | Arts & Science |
| Smoking harmful | 4.6 | 12.2* | 2.7 | 2.9 | 4.7 |
| Forms of tobacco other than cigarettes harmful | 22 | 37.2* | 20.9 | 24.2 | 20.5 |
| Heart disease | 2 | 1.8 | 2 | 1.9 | 2 |
| Lung cancer | 0.6 | 0 | 0.7 | 0.3 | 0.9 |
| Oral cancer | 6.9 | 10.8 | 6.4 | 5.3 | 9* |
| Other cancers | 16.6 | 18.3 | 16.4 | 14.6 | 19.4* |
| Hypertension | 16 | 25.9 | 14.7* | 12.9 | 19.9* |
| Stroke | 25 | 30.5 | 24.4 | 23.4 | 27.2 |
| Sexual dysfunction | 35 | 39.3 | 34.3 | 37.2 | 31.8 |
| Impotence | 44.2 | 44.8 | 44.1 | 46.9 | 40.6* |
| Gum disease | 5 | 7.3 | 14.7 | 4.9 | 5.1 |

*P<0.05

public health strategies to control this potential major health problem, including carrying out further epidemiological and toxicological research and health education.

Our results indicated that both parental and peer smoking were important predictors of smoking. The social influence of parents and peers are important determinants of smoking that are well supported in the literature.¹⁵ These results indicate that smoking prevention programs should take a future family-focused direction and address peer pressure as one of the most important factors which motivate adolescents to smoke.

Although a high level of awareness and a good amount of knowledge about the health consequences of smoking was present among the students, it did not affect their smoking behavior. A simple relationship between risk awareness and smoking behavior should not be expected. A recent study on perceptions about cigarette smoking and risks among college students stated that young people, including college students, tend to under-

value the health consequences associated with smoking.¹⁶ Informing the public, especially such a highly educated and influential group, about the health consequences of smoking remains the back bone of health education. However, better health knowledge alone cannot stem the smoking epidemic especially since the habit develops in adolescents when long term risk may be of little concern and seen as being far in the future. Tobacco control efforts targeting young adults need to emphasize that each cigarette smoked is doing their body harm.

In conclusion, although most of the respondents were aware of the health consequences of smoking, the habit was not uncommon amongst them. The higher rate of water pipe use and the perception that it is less harmful than cigarettes points at an emerging public health problem. More research is necessary to expand our understanding of smoking habits, factors influencing initiation and persistence among females. In addition, collaborative and more comprehensive anti-tobacco efforts are important to curb the tobacco epidemic in Saudi Arabia.

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