Smoking habits among university students in Jordan: prevalence and associated factors

Y.S. Khader[1,2] and A.A. Alsadi[2]

عادات التدخين بين طَلَبة الجامعات في الأردن: معدل الانتشار والعوامل المصاحبة

يوسف خضر، أماني السعدي

الخلاصة: استوفى 712 طالباً في جامعة شمال الأردن استبياناً يستهدف تقدير معدل انتشار التدخين. وكان معدل الانتشار المبلغ عنه حالياً للتدخين هو 35.0% (56.9% للذكور و11.4% للإناث). وكان 80% منهم من مدخني السجائر. وكان معظمهم (86.3%) ممن يدخن يومياً. ومن العوامل التي صاحبت ازدياد معدّل التدخين: الجنس المذكر، وارتفاع الدخل، وتدنّي التحصيل الأكاديمي، وازدياد عدد الأصدقاء أو أفراد الأسرة الذين يدخنون. وقد كان أقل الطَلَبة تدخيناً طَلَبة كليتي الحقوق والشريعة مقارنةً بغيرهما من الكليات. وتدل النتائج على أنه ينبغي على أصحاب القرار السياسي الشروع ببرامج لمكافحة التدخين في الجامعات الأردنية.

ABSTRACT Questionnaires were completed by 712 university students in north Jordan to estimate their prevalence of smoking. The reported prevalence of current smoking was 35.0% (56.9% for males and 11.4% for females). About 80% were cigarettes smokers. The majority (86.3%) of smokers smoked daily. Male sex, higher income, lower academic attainment and higher number of friends or family members who smoke were associated with increased prevalence of smoking. Those in the faculty of religion and law were less likely to smoke compared to those in other faculties. The results suggest that policy-makers need to initiate antismoking programmes in Jordanian universities.

Habitudes tabagiques chez les étudiants de Jordanie : prévalence et facteurs associés
RÉSUMÉ Sept cent douze (712) étudiants du nord de la Jordanie ont complété des questionnaires afin que l'on puisse estimer la prévalence du tabagisme dans cette population. La prévalence déclarée du tabagisme au moment de l'étude était de 35,0 % (56,9 % pour les garçons et 11,4 % pour les filles). Environ 80 % d'entre eux fumaient des cigarettes. La majorité (86,3 %) des fumeurs fumaient quotidiennement. Le sexe masculin, un niveau de revenu élevé, des résultats universitaires peu brillants et un nombre important de fumeurs parmi les amis et les membres de la famille étaient associés à une prévalence accrue du tabagisme. Les étudiants en faculté de religion et de droit étaient moins enclins à fumer que ceux des autres facultés. Ces résultats permettent de penser que les responsables de l'élaboration des politiques doivent mettre en place des programmes de lutte contre le tabagisme dans les universités jordaniennes.

[1]Higher Council for Science and Technology, Amman; [2]Department of Community Medicine, Public Health and Family Medicine, Faculty of Medicine, Jordan University of Science and Technology, Irbid, Jordan (Correspondence to Y.S. Khader: yousef.k@excite.com).
Received: 15/10/05; accepted: 27/03/06

Introduction

The habit of tobacco smoking has spread throughout the world and, as a major source of morbidity and mortality, is a serious public health problem [*1–6*]. Tobacco smoking reduces life expectancy, increases overall medical costs and contributes to loss of productivity during the lifespan of an individual [*7,8*]. Therefore, smoking prevention programmes have been given a high priority in World Health Organization (WHO) policies [*9*].

A recent study that examined smoking habits among university students in 23 countries showed that the age-adjusted prevalence ranged from 2% in Thailand to 46% in Spain among women and from 14% in Thailand to 47% in Portugal among men [*10*]. Epidemiological studies among different university student populations in Arab and Eastern Mediterranean countries demonstrated a marked variation in the prevalence of smoking [*11–21*]. Prevalence ranged from 13.0% to 42.5%, being the highest in Turkey (42.5%) [*12*] and Kuwait (42.2%) [*11*]. An increasing trend is expected to occur among university students and this could be related to alleviation of stress, life problems, peer pressure, social acceptance, family history of smoking, lower educational level of parents and the desire to attain high personality profile [*22*]. In contrast, religion, negative health effects, bad taste and smell, adverse physiological responses and issues related to family are considered good reasons for not smoking [*22,23*].

Studies on smoking habits among university students in Jordan are scarce, with a focus on a specific group of the university student population [*13,14*]. The prevalence of smoking reflects the magnitude of the problem, and determining it is important since it provides a basis for the planning of public health actions. The present study was an epidemiological survey to determine the prevalence of smoking and its associated factors among university students in the north of Jordan.

Methods

Sample

A descriptive cross-sectional study was conducted in April 2005 to estimate the prevalence of smoking among Yarmouk University students in Irbid, Jordan. The total number of students in Yarmouk University at the time of the study was 17 290. The sample size was calculated using a prevalence of smoking of 28.6% reported by Haddad and Malak [*14*], assuming a degree of precision of 3.3% at the 95% confidence interval. The total number of subjects was estimated to be 692. In Yarmouk University, most students, nearly 90%, were enrolled in undergraduate programmes distributed among different faculties.

Data collection

A sample of 3 to 4 classrooms were selected (using simple random sampling) from each faculty. The study coordinator visited the selected rooms between 09:00 and 11:00 hours and explained the purpose of the study to all students who were present. A pilot-tested structured questionnaire, prepared specifically for the study, was administered by the study coordinator who asked the students to respond freely and truthfully to each question. An assurance of anonymity was provided. Students took 5–10 minutes to complete the questionnaire in class while the class instructor was outside the teaching room to ensure that students completed the questionnaire unaided and to ensure confidentiality.

The questionnaire comprised a mix of open-ended and multiple choice questions, aimed at collecting data on the students' sociodemographic characteristics and their smoking behaviour. The following data were collected: age, sex, monthly family income, university year, faculty and student's academic achievement. Academic achievement was measured using grade point average (GPA) and classified as: excellent, very good, good, and acceptable. The questionnaire included additional information on current and previous smoking status, type of smoking and quantity of cigarettes smoked, age of initiation and source of smoking, reasons for starting smoking and attempts to quit smoking. Questions related to reasons for starting smoking and reasons for not smoking were open-ended. The smoking behaviour of the student, his or her family members and closest friends was obtained.

Each student's smoking status was classified as: daily smoker (smokes some kind of a tobacco product at least once a day); occasional smoker (smokes, but less than once a day); former smoker (smoked daily for at least 6 months, but did not smoke at the time of survey); never smoker (never smoked). For the purpose of international comparisons, occasional smokers and daily smokers were collapsed to produce the category "current smokers". A response category for cigar or pipe or waterpipe (*nargile*) smoking was collapsed into the same category.

A total of 812 structured questionnaires were distributed and 712 (88%) were fully completed. A total of 34 questionnaires were returned unfilled and 66 had missing responses on the main study questions. Seven questionnaires, with 1 or 2 missing responses for some items of the questionnaire, were considered satisfactory and included in the analysis.

Analysis

Data were analysed by comparing the prevalence of smoking between students according to independent variables using the Pearson chi-squared test. Chi-squared test for trend was conducted where appropriate. Multivariate binary logistic regression analysis was conducted to determine factors associated with smoking. *SPSS*, version 11.5, was used for data analysis. A P-value < 0.05 was considered statistically significant.

Results

Participants' characteristics

The study included 369 males and 343 females. The age of respondents ranged from 17 to 28 years with a mean of age of 21.2 years. More than half (60.3%) were between 20 and 24 years old (Table 1). About 60% of respondents were current students in 3 faculties: economic and administrative sciences (28.4%), literature (18.4%) and science (14.5%). About 51% were 3rd year or 4th year students. One-quarter of students had a total family income of more than 750 Jordanian dinars (JD).

Prevalence of smoking and its associated factors

A total of 249 students out of 712 reported being smokers. Thus the prevalence of current smoking among this sample of university students was 35.0% (56.9% among males and 11.4% among females, $P < 0.0005$). The majority of smokers (86.3%) smoked daily. About 80% were cigarette smokers, 19.3% were waterpipe smokers and 0.4% were pipe or cigar smokers. More than half (56.0%) of cigarette smokers smoked < 10 cigarettes/day, 21.5% smoked 10–20 cigarettes/day and 22.5% smoked > 20 cigarettes/day.

Table 1 **Prevalence of current smoking among Yarmouk University students, Jordan, by demographic and academic characteristics**

Variable	Total No.	Smoking No.	Smoking %	*P*-value
Sex				
Male	369	210	56.9	< 0.0001
Female	343	39	11.4	
Age (years)				
17–19	258	60	23.3	< 0.0001
20–24	429	179	41.7	
25–28	25	13	52.0	
Faculty				
Literature	131	36	27.5	< 0.0001
Economic and administrative sciences	202	97	48.0	
Education	75	22	29.3	
Fine arts and sport	66	23	34.8	
Science	103	48	46.6	
Religion and law	72	10	13.9	
Engineering (*hajjawi*)	63	13	20.6	
Year				
1st	167	38	22.8	< 0.0001
2nd	185	64	34.6	
3rd	144	63	43.8	
4th	216	84	38.9	
Academic achievement				< 0.0001
Acceptable	72	47	65.3	
Good	316	118	37.3	
Very good	260	72	27.7	
Excellent	64	12	18.8	
Family income (JD/month)				0.007
< 250	231	62	26.8	
250–500	318	117	36.8	
> 500–750	43	17	39.5	
> 750	120	53	44.2	

JD = Jordanian dinar.

Prevalence of current smoking among university students by selected categorical variables is shown in Table 1. It increased significantly with age ($P < 0.0001$). Third year and 4th year students were more likely to smoke compared with junior students ($P < 0.0001$). There was a significant difference in smoking prevalence among the students who attended different faculties, whereby students from the faculty of religion and law were less likely to smoke compared with students who attended other faculties ($P < 0.0001$). The prevalence of smoking increased significantly with increasing income ($P = 0.007$) and with decreasing academic achievement. Increased prevalence of smoking was significantly associated with an increased number of family members who smoke (*P*-value for trend < 0.005) and an increased number of friends who smoke (*P*-value for trend < 0.0001).

In the multivariate analysis, the only factors that were significantly associated with current smoking were sex, faculty, academic year, academic achievement, family income, number of family members who smoke and number of close friends who smoke (Table 2). Male sex, higher income, lower academic attainment and increased number of friends or family members who smoke were associated with increased smoking. Compared with 1st year students, 2nd, 3rd and 4th year students had higher odds of being smokers. Those in the faculty of literature, economic and administrative sciences, fine arts and sport, and science were more likely to smoke compared to those in the faculty of religion and law.

Initiation of smoking and desire to quit

The majority (85.5%) of smokers started smoking at or after the age of 15 years. Fewer started smoking between 10 and 14 years. Friends were considered the major reason for starting smoking by 47.4% of respondents. Pleasure (38.9%) was the next

Table 2 **Multivariate analysis of factors associated with smoking among Yarmouk University students, Jordan**

Variable	Odds ratio (95% CI)	*P*-value
Sex (male vs. female)	9.38 (6.14–14.33)	< 0.0001
Faculty		
Religion and law	1.00	
Literature	2.43 (1.02–5.78)	0.044
Economic and administrative sciences	2.30 (1.01–5.20)	0.045
Education	2.35 (0.90–6.08)	0.079
Fine art and sport	2.98 (1.12–7.89)	0.027
Science	3.34 (1.38–8.10)	0.007
Engineering (Hijjawi College)	0.77 (0.28–2.11)	0.617
Academic year		
1st	1.00	
2nd	1.81 (1.04 –3.12)	0.034
3rd	2.51 (1.40 –4.48)	0.002
4th	1.99 (1.15 –3.44)	0.014
Academic achievement		
Excellent	1.00	
Acceptable	4.00 (1.56–10.2)	0.004
Good	2.03 (0.93–4.43)	0.073
Very good	1.55 (0.70–3.43)	0.277
Family income (JD/month)	1.01 (1.00–1.01)	0.006
No. of family members who smoke	1.18 (1.04–1.34)	0.008
No. of close friends who smoke	2.22(1.95–2.53)	< 0.0001

CI = confidence interval; JD = Jordanian dinar.

most common reason given for smoking initiation, followed by stress (30.5%) and curiosity (12.8%).

About 54% of smokers reported that they had tried to quit smoking previously but had failed, whereas 46% had not attempted to quit smoking. More smokers (38.9%) did not know if they would quit smoking in the future, compared with about 37% who claimed that they intended to quit smoking in the future. In contrast, about a quarter of smokers did not intend to quit smoking for any reason in the future. Reasons for not smoking among nonsmokers are presented in Table 3; a third reported that they did not smoke because of the side-effects of smoking and another third reported religious reasons as the main reason for not smoking.

Discussion

The main finding of this study was that about a third (35.0%) of Yarmouk University students were current smokers. This prevalence is higher than that reported from the medical and engineering colleges in another university in the north of Jordan (28.6%) [*14*]. The difference may be explained by the greater range of university faculties covered in the present study, as a student's major may be a factor in attitudes toward smoking. Compared to other countries, the prevalence is higher than that

Table 3 **Reasons for not smoking as reported by Yarmouk University students, Jordan**

Reason	No. (*n* = 436)	%
Adverse effects on health	165	35.6
Religious reasons	152	32.8
Useless habit	125	26.9
To save money	9	1.9
Family members dislike smoking	6	1.5
Smoking not acceptable in society	5	1.0
Warning from parents	7	1.7
Have asthma	2	0.4

reported in nearby countries such as the Syrian Arab Republic [*21*], Saudi Arabia [*19*] and Lebanon [*16*] and lower than that reported in Kuwait [*11*] and Turkey [*12*]. However, this variation may be partly due to the use of different criteria for defining smoking, different age groups studied and different methodologies adopted. Therefore, a comparison of data between reports is difficult.

Our finding is consistent with other studies reporting that the most common age for starting smoking was between 15 and 19 years among all ever-smokers [*14,23*]. Comparison of our findings with Haddad and Malak's study in 2002 [*14*] shows a rapid increase in the number of smokers and this may be explained by the expanded marketing of transnational tobacco industries in developing countries [*9*].

This study indicates that the prevalence of smoking increased significantly with higher number of years of university education. This may be because senior students have a longer exposure to older smokers (i.e. older friends, teachers, employees, etc.) within the university environment who are an influence on their attitudes and behaviour. These findings are consistent with the findings of other studies [*14,23*] and suggest a need for an increased emphasis on effective antismoking programmes among students in secondary schools and universities to discourage smoking and raise awareness of the adverse health effects of smoking.

There was a significant difference in the prevalence of smoking by sex: 56.9% among males and 11.4% among females. This is in agreement with many studies conducted in Mediterranean and Arab countries that report a significantly higher prevalence of smoking among males, which may be due to the social acceptability of the smoking habit among men [*12,14,19,24–27*]. However, the prevalence of smoking among women may be underestimated because of reporting bias. Furthermore, the low prevalence of smoking among women is not necessarily "a good sign"; it may indicate the start of a rising trend that needs to be monitored and controlled by public health workers.

Students from the faculty of religion and law were less likely to smoke compared with students who attended other faculties. This finding suggests that functional religiosity in late adolescence may assist in promoting the health of both men and women.

Friends were considered the major reason for starting smoking, followed by pleasure, stress and curiosity. Other researchers had similar results [*14,22*]. It seems that youth use the undesirable behaviour of smoking as a strategy to cope with stress and social anxieties [*24*] rather than beneficial pastimes such as reading books or playing sport.

About 37% of smokers expressed a desire to quit smoking in the near future. A high percentage of students who intend to stop smoking was reported by other studies in the Eastern Mediterranean Region [*14,19,27*]. This may be related to respondents' fears of the harmful effects of smoking upon their health. Another reason could be a desire to save money. This indicates that a high proportion of smokers may respond well to smoking cessation programmes if these were made available in the university.

The main limitation of this study was the inability to generalize our results to all university students in Jordan because students with health-related majors were not included in this study. Furthermore, selection bias and information bias cannot be excluded, especially among female students.

We recommend that the factors identified in this study should be taken into consideration in antismoking programmes to make them more effective and better able to influence the attitudes and behaviours

of smokers. Programmes need to be established that involve adolescents and youths as educators and supply them with correct and appropriate information about the health consequences of smoking to educate the community. The Ministry of Education and Higher Education should apply antismoking programmes in all primary and secondary schools and universities. In addition, the media can assist by disseminating the message of quitting smoking to the whole population in Jordan.

References

1. Wald NJ, Hackshaw AK. Cigarette smoking: an epidemiological overview. *British medical bulletin*, 1996, 52:3–11.
2. Illing EM, Kaiserman MJ. Mortality attributable to tobacco use in Canada and its regions, 1991. *Canadian journal of public health*, 1995, 86:257–65.
3. Giovano GA et al. Epidemiology of tobacco use and dependence. *Epidemiologic reviews*, 1995, 17:48–65.
4. Louie D. The effects of cigarette smoking on cardiopulmonary function and exercise tolerance in teenagers. *Canadian respiratory journal*, 2001, 8:289–91.
5. Fielding J. Smoking health effects and control. *New England journal of medicine*, 1985, 313:491–8.
6. Cresanta JL. Epidemiology of cancer in the United States. *Primary care*, 1992, 19:419–41.
7. Bronnum H, Juel K. Abstention from smoking extends life and compresses morbidity: a population based study of health expectancy among smokers and non-smokers in Denmark. *Tobocco control*, 2001, 10:237–78.
8. Cockerham WC. *Health and social change in Russia and Eastern Europe*. New York, Routledge, 1999.
9. Plan of action for tobacco control in the Eastern Mediterranean region. *Eastern Mediterranean health journal*, 1997, 3(1):168–75.
10. Steptoe A et al. An international comparison of tobacco smoking, beliefs and risk awareness in university students from 23 countries. *Addiction*, 2002, 97:1561–71.
11. Alansari B. Prevalence of cigarette smoking among male Kuwait University undergraduate students. *Psychological reports*, 2005, 96:1009–10.
12. Metintas S et al. Smoking patterns of university students in Eskisehir, Turkey. *Public health*, 1998, 112(4):261–4.
13. Kofahi MM, Haddad LG. Perceptions of lung cancer and smoking among college students in Jordan. *Journal of transcultural nursing*, 2005, 16(3):245–54.
14. Haddad LG, Malak MZ. Smoking habits and attitudes towards smoking among university students in Jordan. *International journal of nursing studies*, 2002, 39(8):793–802.
15. Almas K, Al-Hawish A, Al-Khamis W. Oral hygiene practices, smoking habit, and self-perceived oral malodor among dental students. *Journal of contemporary dental practice*, 2003, 4(4):77–90.
16. Tamim H et al. Tobacco use by university students, Lebanon, 2001. *Addiction*, 2003, 98(7):933–9.
17. Saatci E et al. Predictors of smoking behavior of first year university students: questionnaire survey. *Croatian medical journal*, 2004, 45(1):76–9.

18. Ahmadi J et al. Cigarette smoking among Iranian medical students, resident physicians and attending physicians. *European journal of medical research*, 2001, 6(9):406–8.

19. Hasim TJ. Smoking habits of students in College of Applied Medical Science, Saudi Arabia. *Saudi medical journal*, 2000, 21(1):76–80.

20. Maziak W, Mzayek F. The dynamics of tobacco smoking among male educated youths in Aleppo, Syria. *European journal of epidemiology*, 2000, 16(8):769–72.

21. Maziak W et al. Characteristics of cigarette smoking and quitting among university students in Syria. *Preventive medicine*, 2004, 39(2):330–6.

22. Kegler M et al. The functional value of smoking and non-smoking from the perspective of American Indian youth. *Family & community health*, 1999, 22:31–42.

23. Felimban F, Jarallah J. Smoking habits of secondary school boys in Riyadh, Saudi Arabia. *Saudi medical journal*, 1994, 15:438–42.

24. Melani AS et al. Tobacco smoking habits, attitudes and beliefs among nurse and medical students in Tuscany. *European journal of epidemiology*, 2000, 16:607–11.

25. Mammas I et al. Cigarette smoking, alcohol consumption, and serum lipid profile among medical students in Greece. *European journal of public health*, 2003, 13:278–82.

26. Felimban F. The smoking practices and attitudes towards smoking of female university students in Riyadh. *Saudi medical journal*, 1993, 14:220–4.

27. Bener A, Stewart T, Al-Ketabi L. Cigarette smoking habits among high school boys in the United Arab Emirates. *International quarterly of community health education*, 1999, 18:209–22.