

# Prevalence, patterns and knowledge of effects on health of smoking among medical students in Pakistan

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معدلات انتشار التدخين وأنماطه والمعارف حول تأثيره على الصحة بين طلاب الطب في باكستان  
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**الخلاصة:** وزع الباحثون استمارات للمسح بين جميع طلاب الطب ممن درسوا الطب فترة لا تقل عن سنتين في 3 كليات طبية في البنجاب، باكستان. ومن بين 1529 مستجيباً (544 طالباً و985 طالبة) كان 21.5% قد دخنوا في وقت ما في حياتهم (ولو لمرة واحدة على الأقل)، و9.1% منهم مدخنين حالياً (منهم 5.7% يدخنون يومياً)، و0.7% منهم مدخنين سابقاً، و11.7% منهم يدخنون أحياناً. وقد كانت النسبة المئوية لمن دخن في وقت ما في حياته 48% لدى الطالبات و6.7% لدى الطلاب، وكانت النسبة المئوية للمدخنين حالياً 23.2% لدى الطلاب و1.3% لدى الطالبات، وكانت النسبة المئوية لمن يدخن يومياً 14.7% لدى الطلاب و0.7% لدى الطالبات. وكانت نسبة غير المدخنين الذين يعرفون طبيعة تدخين السجائر المؤذية والمسببة للإدمان أعلى منها لدى المدخنين.

**ABSTRACT** A questionnaire survey was conducted among all medical students with at least 2 years of medical education studying at 3 medical colleges in Punjab, Pakistan. Of the 1529 respondents (544 males and 985 females), 21.5% were ever smokers (smoked at least once in their lifetime): 9.1% current smokers (including 5.7% daily smokers), 0.7% ex-smokers and 11.7% occasional smokers. The proportions of ever smokers among males and females were 48.3% and 6.7% respectively, and of current smokers were 23.2% and 1.3%. The proportion of males and females smoking daily was 14.7% and 0.7%. The proportion of nonsmokers who knew about the addictive and harmful nature of cigarette smoking was higher than that among the smokers.

## Prévalence, caractéristiques et connaissance des effets sur la santé du tabagisme chez des étudiants en médecine au Pakistan

**RÉSUMÉ** Une étude par questionnaire a été réalisée auprès de tous les étudiants en médecine ayant suivi au moins deux années d'études et inscrits dans trois facultés de médecine du Pendjab (Pakistan). Sur les 1 529 étudiants interrogés (544 garçons et 985 filles), 21,5 % avaient déjà fumé (au moins une fois dans leur vie) : 9,1 % fumaient régulièrement (dont 5,7 % tous les jours), 0,7 % étaient d'anciens fumeurs et 11,7 % des fumeurs occasionnels. Les proportions de garçons et de filles qui avaient déjà fumé étaient respectivement de 48,3 % et 6,7 %, et pour ceux qui fumaient encore, de 23,2 % et 1,3 %. Les proportions de garçons et de filles qui fumaient tous les jours étaient de 14,7 % et 0,7 %. La proportion de non-fumeurs qui étaient au courant de la dépendance engendrée par la cigarette et de ses effets nocifs était plus élevée que celle des fumeurs.

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## Introduction

The great mass of literature on the effects of smoking on health has left no doubt that smoking is a major preventable cause of morbidity and mortality. According to the World Health Organization (WHO), smoking causes about 4 million deaths annually. This number is likely to increase if current smoking patterns persist [1].

Of the 1.1 billion smokers in the world today, about 80% live in developing countries [2]. In contrast to the fall in tobacco consumption in most high-income countries between 1981 and 1991, consumption of tobacco-related products is increasing in developing countries by about 3.4% per year [1].

In Pakistan, a developing country, about 50 000 acres of land are used for tobacco cultivation [3]. The tobacco industry is expanding at a rate of 5% per year, which is greater than Pakistan's annual population growth rate of 2.6% [4], signifying an increase in tobacco usage. Although a law banning smoking in public places was introduced in 2002 [5], it has not been fully implemented. Total tobacco consumption has been estimated to be 25.4% among men and 3.5% among women in the general population [6].

The situation is therefore a matter of concern, especially since smoking is prevalent among medical students, the future health care providers of the country. In this study we aimed to determine the prevalence and patterns of smoking among Pakistani medical students, as well as their basic knowledge regarding its ill-effects on health.

## Methods

### Survey sample

The study was a cross-sectional survey, conducted in 3 of the 5 medical colleges in

Punjab, Pakistan. In Pakistan, medical education spans 5 years, with the first 2 years reserved for teaching the basic sciences, and the last 3 for clinical teaching. The medical colleges chosen were Rawalpindi Medical College, Punjab Medical College and Quaid-e-Azam Medical College, located in Rawalpindi, Faisalabad and Bahawalpur respectively. Rawalpindi is a city of 1.4 million located in northern Punjab. Faisalabad is a city of 2.6 million located in central Punjab, and Bahawalpur is a city of 0.4 million located in southern Punjab.

All students in these 3 medical colleges with at least 2 years of medical education ( $n = 2250$ ) were included in the study so that the effect of medical education on their smoking prevalence and patterns could be observed. The students were approached before attendance of compulsory lectures at their respective medical schools. On the days of the survey 450 (20.0%) students were absent and 267 (14.8% of those present) did not complete the questionnaire; therefore 1533 students completed the questionnaire, giving a response rate of 85.2%. Data were missing in some categories, so smoking frequency by sex was analysed for 1529 students.

### Questionnaire and procedure of administration

The questionnaires were delivered during lectures which are mandatory for all students to attend. They were distributed and collected before the lecture started. The questionnaire was accompanied by an introductory letter, was self-administered and completely confidential and anonymous; there was no pressure to respond. The questionnaire contained 12 questions with a tick-box format and took about 5 minutes to complete.

Students were asked whether they thought that smoking is addictive (yes/

no), whether smoking causes a decrease in life expectancy (yes/no) and to what degree smoking is a cause of lung cancer and heart disease (from major cause to no association).

To define smoking status, students were asked if they had ever smoked a cigarette. If yes, they were classified as ever smokers. Ever smokers who had smoked more than 100 cigarettes in their entire life, but had not smoked in the past 30 days, were classified as ex-smokers. Ever smokers who had smoked in the past 30 days were classified as current smokers. Current smokers were further asked whether they smoked every day (daily smokers). Ever smokers who had smoked fewer than 100 cigarettes in their life and had not smoked in the past 30 days were classified as occasional smokers. Current smokers were asked to choose 1 out of 5 options to indicate their frequency of smoking. The options were: < 1/week;  $\geq$  1/week < 1/day;  $\geq$  1/day < 15/day;  $\geq$  15/day < 25/day;  $\geq$  25/day. Other questions included the age at which they started smoking, and the effect of joining medical college on their smoking status.

Ethical approval was granted by the ethical committee of Rawalpindi Medical College.

## Analysis

All analysis was carried out using SPSS for Windows, version 10.0.1. The Student *t*-test was used on continuous data with normal distribution and the chi-squared test was used on categorical data.

## Results

The distribution of the respondents was: 31.0% Rawalpindi Medical College, 29.7% Punjab Medical College and 39.3% Quaid-e-Azam Medical College. They were evenly distributed by year: 34.2% were in their 3rd year of medical education, 31.0% in their 4th and 34.8% in their final year. Because there were missing responses in some categories, percentages are reported out of the total responding to each question.

There were 544 (35.6%) male and 985 (64.4%) female students who answered the questions about smoking frequency. This disparity reflects the higher proportion of females studying in medical colleges in Pakistan. The mean age of the respondents was 22.2 [standard deviation (SD 1.4)] years, range 17–37 years.

The breakdown of the smoking status of the 1529 students is shown in Table 1

Table 1 Smoking status of medical students in the 3 medical colleges

Smoking status	Males (n = 544)		Females (n = 985)		Total (n = 1529)	
	No.	%	No.	%	No.	%
Never smoker	281	51.7	919	93.3	1200	78.5
Ever smoker	263	48.3	66	6.7	329	21.5
Ex-smoker <sup>a</sup>	11	2.0	0	0	11	0.7
Current smoker <sup>b</sup>	126	23.2	13	1.3	139	9.1
Daily smoker <sup>c</sup>	80	14.7	7	0.7	87	5.7
Occasional smoker <sup>d</sup>	126	23.2	53	5.4	179	11.7

<sup>a</sup>Smoked  $\geq$  100 cigarettes in their life but not smoked in the past 30 days.

<sup>b</sup>Smoked in the past 30 days.

<sup>c</sup>Smoke every day.

<sup>d</sup>Smoked < 100 cigarettes in their life and not smoked in the past 30 days.

n = total number of respondents.

Table 2 Frequency of cigarette smoking among medical students who are current smokers

No. of cigarettes smoked	Males (n = 125) <sup>a</sup>		Females (n = 11) <sup>a</sup>		Total (n = 136) <sup>a</sup>	
	No.	%	No.	%	No.	%
< 1/week	26	20.8	4	36.4	30	22.1
≥ 1/week < 1/day	19	15.2	0	0.0	19	14.0
≥ 1/day < 15/day	34	27.2	1	9.1	35	25.7
≥ 15/day < 25/day	15	12.0	0	0.0	15	11.0
≥ 25/day	31	24.8	6	54.5	37	27.2

<sup>a</sup>Data were missing for some items.

n = total number of respondents.

and the frequency of cigarette smoking among current smokers is shown in Table 2. Overall, 78.5% were never smokers, 9.1% were current smokers, including 5.7% who were daily smokers and 11.7% were occasional smokers. Of the males 263 were ever smokers (48.3%) compared with 66 of the females (6.7%); the proportion of female smokers was significantly lower than male smokers in all groups ( $P < 0.01$ ).

The mean age at which ever smokers first smoked was 16.5 (SD 4.6) years among males and 15.2 (SD 4.6) years among females ( $P < 0.05$ ). A high proportion of the male (99, 39.4%) and female (19, 31.7%) ever smokers started smoking after joining medical college; in addition, 148 (77.9%) of the ever smokers, 121 (93.1%) of the current smokers and 81 (95.3%) of the daily smokers said that the frequency had increased, with no significant difference between males and females.

Knowledge about the deleterious effects of smoking was lowest among current smokers and highest among never smokers. A high proportion of never smokers agreed that smoking is addictive and causes a decrease in life expectancy (88.1% and 94.6% respectively) compared with just over half the current smokers (52.5% and 52.5% respectively) (Table 3). Similarly 82.4% of never smokers and only 45.7% of current smokers agreed that smoking is a major cause of lung cancer (Table 4). More never smokers agreed that smoking is a contributing cause of heart disease (70.7%) than did current smokers (36.9%) (Table 4).

## Discussion

In this study in Pakistan, the prevalence of smoking among medical students was roughly the same as that among the general

Table 3 Medical students' knowledge about the addictive nature of smoking and decreased life expectancy for smokers

Smoking status	Smoking is addictive		Smoking decreases life expectancy	
	No./total no. of respondents <sup>a</sup>	%	No./total no. of respondents <sup>a</sup>	%
Never smoker	1055/1198	88.1	1132/1197	94.6
Ever smoker	223/330	67.6	233/329	70.8
Current smoker	73/139	52.5	73/139	52.5

<sup>a</sup>Data were missing for some items.

Table 4 Medical students' knowledge about the relationship of smoking to lung cancer and heart disease

Disease/smoking status	Major cause		Contributing cause		Don't know		Associated		No association	
	No.	%	No.	%	No.	%	No.	%	No.	%
<i>Smoking and lung cancer</i>										
Never smoker (n = 1179) <sup>a</sup>	971	82.4	162	13.7	6	0.5	34	2.9	6	0.5
Ever smoker (n = 313) <sup>a</sup>	182	58.1	73	23.3	8	2.6	24	7.7	26	8.3
Current smoker (n = 129) <sup>a</sup>	59	45.7	28	21.7	5	3.9	14	10.9	23	17.8
<i>Smoking and heart disease</i>										
Never smoker (n = 1169) <sup>a</sup>	199	17.0	827	70.7	25	1.2	104	8.9	14	1.2
Ever smoker (n = 314) <sup>a</sup>	75	23.9	148	47.1	14	4.5	39	12.4	38	12.1
Current smoker (n = 130) <sup>a</sup>	30	23.1	48	36.9	6	4.6	15	11.5	31	23.8

<sup>a</sup>Data were missing for some items.

population [6], with a similar difference in prevalence between the sexes. Knowledge about the addictive and harmful effects of smoking was lower than might be expected among a group of medical students.

The study was conducted on a relatively large sample in 3 medical colleges that were geographically well spread out in the country's largest province, Punjab. The response rate was also high (although 15% of the students were not present in class on the day of the survey and were excluded). The limitations are that the study was only carried out in government medical colleges and none of the private sector medical colleges, catering for about half of Pakistan's medical students, were represented. The questionnaire was designed to be quite short, to encourage a high response rate. This, however, limited the scope of the study to only the prevalence, patterns and knowledge regarding the effects of smoking. Other information, for example attitude towards smoking, attempts to quit and smoking profile of parents, was not gathered.

Another study done in a private sector medical college in Karachi, Pakistan [7], showed a similar prevalence of smoking, and a similar proportion of students who

had taken up smoking after joining medical college. However, unlike this study, the results of that study indicated a good knowledge about the ill-effects of smoking on health. A study carried out in a state medical school in Shanghai, China [8] showed a similar prevalence of smoking among medical students. That study also showed a lack of knowledge among medical students regarding the ill-effects of smoking on health, and a marked difference in the level of knowledge among smokers and nonsmokers.

A notable finding of our study was the high prevalence of smoking among medical students. We might have expected that the prevalence of smoking would be low among a group of future doctors. Furthermore, many students took up smoking, and most of the smokers increased their frequency of smoking, after joining medical college.

Knowledge about the addictive nature and ill-effects of smoking was found to be poor among students in general, and especially among smokers. Regular smokers showed poorer knowledge than occasional or never smokers. This could mean that students with poor knowledge are more likely to take up smoking or that once students

start smoking they tend to deny that their habit is harmful to their health.

The prevalence of smoking was much lower in females than among males. This probably reflects the different social roles of the sexes in the country, with men being more independent, and therefore more likely to take up smoking. As in other countries, tobacco advertisement in sports, depicting physically fit and athletic men smoking, may also play a part [9].

The implications of this study are that in Pakistan medical students should be made more aware of the harmful effects of smoking. Those who wish to stop should be offered help. Implementation of legal restrictions such as prohibition of smoking on campus and at hospitals might discourage some students. Advertisements for tobacco products and their association with adventure and a "macho" image may be a major

contributory factor in the high prevalence in men. Further research into the history and pattern of smoking in these students might throw more light on other causes of this high prevalence.

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