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Medical students of Kyrgyzstan: Smoking prevalence and attitudes to smoking cessation counseling ☆

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Summary
Study objective: To determine the current prevalence of smoking among medical students and to ascertain their readiness for counseling on smoking cessation.
Methods: Cross-sectional randomized study, in which 297 medical students (146 males and 151 females) completed a questionnaire and exhaled carbon monoxide (CO).
Setting: Kyrgyz State Medical Academy in Bishkek, Kyrgyzstan.
Results: The overall prevalence of smoking among medical students was 35% (47.9% among men and 22.5% among women), with the highest rate among year 6 students (85.7% for men and 58% for women). The CO-adjusted prevalence for the entire sample was 44.8%. Overall 69% of students believed that smoking is related to cancer and chronic diseases however, the longer students were in school, the less confidence they demonstrated in this relationship. While 85.2% reported that advice should be given to smokers to stop, only 63% considered it potentially effective. Only 17.2% were aware of the Framework Convention on Tobacco Control, 90% of these supported its ratification, women significantly more so than men OR = 2.24, $p < 0.05$. Non-smokers expressed a greater demand for more information on smoking-related diseases and treatment of tobacco dependence (OR = 2.94, $p < 0.05$). Smokers were more likely to consume alcohol (OR = 4.0, $p < 0.001$) with no-alcohol students being more committed to tobacco control.

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Conclusions: Across the years of study, the prevalence of smoking among medical students increased, and reached its peak at year 6. The lack of knowledge about tobacco control along with a decreased potential for anti-smoking advocacy likely reflect deficiencies in the educational curricula. There is an urgent need to address relevant changes in the educational curricula for medical students.

Introduction

Kyrgyzstan is a low-income country with a high prevalence of respiratory diseases accounting for 27% of adult morbidity in 2003. It currently faces stage 2 of the tobacco epidemic, with both a rising prevalence and an increasing mortality from smoking among men and women [1]. Smoking in Kyrgyzstan results in a large number of premature deaths, 2100 in the year 2000 [2]. Developing countries contributed 2.41 million smoking-related deaths to the 4.83 million deaths globally in the year 2000. By the year 2030, it is estimated that there will be 10 million deaths attributable to smoking, with 70% of these occurring in the developing world. According to the World Bank, a 50% reduction in tobacco consumption by the year 2020 could prevent 180 million tobacco-related illnesses [3].

Unregulated tobacco advertisement, aggressive expansion by the tobacco industry, legislative failures and a very low level of public awareness about tobacco have brought Kyrgyzstan into the fore of rising tobacco consumption. A reduction in the prevalence of smoking is imperative in addressing this public health problem.

The smoking behaviour of medical service providers and their own lack of knowledge have been acknowledged as an obstacle to the promotion of smoking cessation [4]. The prevalence of smoking among medical students has been assessed in many studies around the world, with rates up to 56.9% in men and 44.7% in women [5]. Central Asia remains poorly described as very few studies have been done in this region [6]. Since the majority of studies worldwide were reported prior to the introduction of the Framework Convention on Tobacco Control (FCTC), recent achievements in tobacco control may have changed the situation.

Physicians have a unique potential to contribute to tobacco control in several ways, including as role models, through counseling, and by increasing public awareness of the hazards of smoking [4]. This study was undertaken to determine the current prevalence of smoking among medical students in Kyrgyzstan during their training, and to ascertain their readiness for smoking cessation counseling.

Materials and methods

Design and subjects

This was a cross-sectional randomized study with a random sample of 297 (20%) of 1485 medical students from the Kyrgyz State Medical Academy in the capital of the country, Bishkek. We chose this school only because the other 3 medical faculties in Kyrgyzstan had too few students.

One physician was responsible for data collection and communication with the selected students. Data collection was followed by a 10-min explanation on tobacco control issues and on the use of exhaled carbon monoxide (CO) measurement in smoking cessation counseling. The survey was carried out at the beginning of the 2005 academic year over the 2 months, September and October.

Methods

The survey instrument consisted of 24 questions in three sections:

(1) three questions to determine the smoking status as recommended by the World Health Organization (WHO):
   (a) Have you ever smoked,
   (b) Do you smoke currently and
   (c) Do you smoke everyday? [7];
(2) the number of cigarettes smoked, the Fagerstrom Test for Nicotine Dependence (FTND), willingness to stop smoking if applicable and attitudes regarding counseling smokers in the future;
(3) the need for information and the desire for changes to the study curriculum to address tobacco control in more depth. This section also examined readiness to participate in anti-tobacco activities, and attitudes to the FCTC.

To probe attitudes towards counseling, the second section of the questionnaire asked if there was evidence of a relation between smoking and chronic diseases, such as coronary artery disease

and chronic obstructive pulmonary disease; whether a physician has to give advice to every smoker; could such advice have an impact and we examined whether the service provider's sex influenced attitudes about effectiveness. The third section asked if students needed additional information on smoking-related diseases and ways to treat tobacco dependence, which course in their mind should be enhanced; if they were willing to participate in anti-tobacco activities, if they knew what the FCTC was and whether it needed ratification, and finally, how much alcohol they consumed.

Smoking status was verified with the use of a portable exhaled CO sensor (piCO, Bedfont, UK), using 7 ppm as the cut-off to identify current smokers and non-smokers [8–10].

Statistical analysis

Data were analyzed using Statistica V6.0 Statsoft. Responses were analyzed for distribution using the Shapiro–Wilk test and were found to have a normal distribution. *t*-Test (two-tailed) and χ^2 (for categorical data) were used to determine statistical significance. Correlations were calculated using Pearson coefficient and χ^2 for categorical data.

Logistic regression was applied to assess the impact of independent variables (age, sex, smoking, etc.) on dependent variables, such as willingness to give advice and attitudes.

Results

Smoking prevalence

There was a near equal distribution of men and women in the sample, 49.2% vs. 50.8% with a mean age of 20.2 ± 2.4 years. There were 43.4% self-reported never-smokers among the medical students, mostly among the 1st year students, which had the largest representation (Table 1). The self-reported current smoking prevalence (daily and occasional smokers) was 35.0%, however, there was a dramatic change within the study period. At graduation, current self-reported smoking rates were the highest, reaching 60%. There were more daily smokers among men compared to women, 35.6% vs. 12.6% ($p < 0.05$); men smoked more cigarettes, 9.8 ± 6.1 vs. 4.3 ± 2.6 ($p < 0.05$), and they were more dependent, FTND score 1.6 ± 1.6 vs. 0.6 ± 0.7 ($p < 0.05$).

Table 1 Smoking status and smoking behaviour of self-reported smokers during the course of studies

Indicator	All Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Never smokers, *N* (%)	129 (43.4)	39 (60)	21 (40.4)	21 (47.7)	13 (33.3)	24 (46.2)	11 (24.4)
Ex-smokers, *N* (%)	64 (21.6)	17 (26.2)	10 (19.2)	8 (18.2)	14 (35.9)	8 (15.4)	7 (15.6)
Daily smokers, *N* (%)	71 (23.9)	6 (9.2)	15 (28.9)	11 (25.0)	6 (15.4)	15 (28.9)	18 (40.0)
Occasional smokers, *N* (%)	33 (11.1)	3 (4.6)	6 (11.5)	4 (9.1)	6 (15.4)	5 (9.6)	9 (20.0)
Exhaled CO, ppm	6.7 ± 7.3	3.9 ± 3.4	6.9 ± 7.7[a]	5.8 ± 5.3[a]	5.8 ± 6.0[a]	7.1 ± 7.8[a]	11.5 ± 10.3[abcde]
Number of cigarettes smoked daily	9.9 ± 6.7	7.2 ± 4.5	7.9 ± 4.2	4.9 ± 2.9	11.3 ± 7.3[c]	8.7 ± 7.4	9.9 ± 6.7[c]
Motivation to stop smoking (0–4)	2.6 ± 1.1	2.6 ± 1.2	2.4 ± 1.0	3.3 ± 0.9[b]	2.6 ± 1.1	2.3 ± 1.0[c]	2.5 ± 1.2[c]

[a] Statistical significance ($p < 0.05$) when compared to year 1 students.
[b] Compared to year 2 students.
[c] Compared to year 3 students.
[d] Compared to year 4 students.
[e] Compared to year 5 students.

Some students declaring themselves as non-smokers had exhaled CO levels exceeding 7 ppm. They ranged from 10.3% of all non-smokers at year 3 to 27.8% at year 6. When self-reported non-smokers having CO $\geqslant$ 7 ppm were included, the smoking prevalence increased from 35.0% to 44.8%, and was highest (71%) at year 6.

Smoking behaviour

Neither daily nor occasional smokers showed any difference in the number of cigarettes smoked between years of study, except for the daily year 4 and year 6 smokers (Table 1). Women smoking fewer cigarettes and having lower addiction scores than men, nevertheless, were similarly not ready to stop smoking.

In general, medical students were low-dependent smokers with a low motivation to stop smoking. The smoking intensity of daily smokers was closely associated with motivation to stop smoking, Pearson for means $r = -0.63$ ($p = 0.001$). Only 23.1% of smokers were willing to stop smoking. We found no association between willingness to cease smoking and readiness to participate in anti-tobacco activities ($r = 0.09$).

Knowledge about smoking-related morbidity

Medical students' knowledge on tobacco control issues was poor. Only 69% of medical students agreed that smoking was related to cancer and chronic illnesses. Smokers did not differ from non-smokers in this low level of knowledge (64.4% vs. 71.5%, $\chi^2 = 1.6$). Non-smokers expressed a significantly greater demand for more in-depth information on smoking-related illnesses and ways to treat tobacco dependence (OR = 2.94 and 2.59, $p < 0.05$) (Tables 2 and 3). Only the year of study influenced awareness — the longer students stayed in the medical school, the less they were confident about evidence of smoking-related morbidities. We offered a list of courses including those that might be enhanced with contents on tobacco control issues. Students chose the ''Tobacco or Health'' course (not existing, but proposed) as the most relevant to offer more information on smoking-related diseases.

Attitudes to future counseling and tobacco control issues

Overall 85.2% of students responded that advice should be given to smokers to quit. The largest number (93.2%) was among year 3 students, who were also more committed to stopping smoking themselves. Higher years of training did not result in a greater commitment to advise smokers to stop. Willingness to give advice to stop smoking was not associated with the increase in the percentage of smokers during the study period (Fig. 1). Unlike smoking status, alcohol consumption was associated with decreased confidence that medical professionals should advise smokers to stop. Although willing to give advice, only 63.0% of students believed this advice could be effective, however, non-smokers were more convinced (Table 2).

Table 2 Knowledge and attitude to counseling by smoking status

	Self-reported current smokers (%)	Self-reported non-smokers (%)	*p*-value
Smoking is related to morbidity			
There is 100% evidence	64.4	71.5	0.21
There is not enough evidence	27.9	25.4	0.64
There is little evidence	7.7	3.1	0.08
There is no evidence	0.0	0.0	—
Need to give advice to smokers	80.8	88.6	0.12
Advice may be effective	52.9	68.4	0.008
Advice effectiveness depends on the counselor's sex	31.7	44.6	0.03
Need for advanced information on smoking-related diseases	68.6	81.9	0.001
Need for advanced information on treatment of tobacco dependence	76.0	89.1	0.003
Readiness to participate in anti-tobacco activities	54.8	64.3	0.11
Enough knowledge on FCTC	20.2	15.5	0.31
Need to ratify FCTC	86.5	91.7	0.16

Table 3 ORs (*p*-values) of various aspects of attitudes towards future counseling and FCTC

Indicators	Awareness of smoking-related morbidity	Need to give advice to smoker	Advice can be effective	Need for info on smoking-related morbidity	Need for info on tobacco dependence treatment	Readiness for anti-tobacco activities	Awareness of FCTC	Need to ratify FCTC
Year of study	**0.85 (0.02)**	1.00 (0.94)	0.91 (0.19)	0.90 (0.14)	1.08 (0.42)	0.98 (0.76)	0.93 (0.41)	0.86 (0.18)
Age	0.91 (0.05)	1.06 (0.39)	0.94 (0.24)	0.95 (0.35)	**1.2 (0.04)**	1.03 (0.55)	1.02 (0.79)	1.00 (0.98)
Sex (reference-males)	0.93 (0.76)	1.29 (0.44)	1.0 (0.99)	0.91 (0.72)	1.04 (0.90)	0.75 (0.23)	0.69 (0.23)	**2.24 (0.04)**
Smoking (reference-smokers)	1.39 (0.21)	1.68 (0.12)	**1.93 (0.008)**	**2.94 (0.008)**	**2.59 (0.003)**	1.48 (0.11)	0.74 (0.32)	1.72 (0.17)
Exhaled CO	0.98 (0.21)	0.99 (0.65)	0.99 (0.42)	0.98 (0.18)	1.0 (0.86)	0.97 (0.05)	1.02 (0.33)	0.98 (0.40)
Alcohol (reference-alcohol users)	1.54 (0.1)	**2.37 (0.02)**	1.47 (0.12)	**1.9 (0.02)**	1.7 (0.12)	**1.68 (0.04)**	1.67 (0.09)	1.28 (0.55)

Note: statistically significant (<0.05) ORs are indicated in bold.

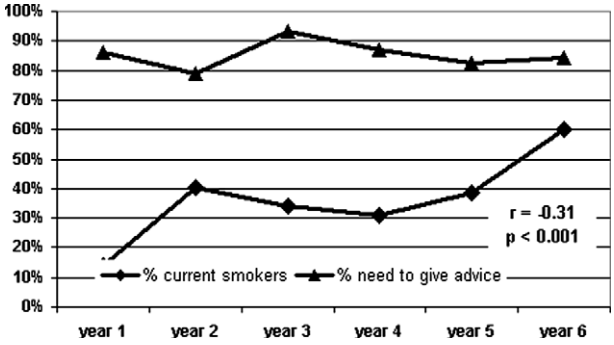

Fig. 1 Numbers of self-reported smokers and willingness to give advice to smokers.

Only 60.9% of all students were willing to participate in anti-tobacco activities. Readiness to participate in anti-tobacco activities was not high for students of both sexes (64.4% for male and 57.6% for female students). Only 17.2% knew what the FCTC was and 90.0% of them agreed that it needed ratification. Students of different years of study had the same low level of awareness of the FCTC. Women were more supportive of FCTC ratification (Table 3).

Alcohol consumption

Smoking was associated with increased alcohol consumption, but alcohol did not seem to be associated with more frequent smoking (Table 3). The OR of alcohol consumption was 4.0 for smokers ($\chi^2 = 26.3$, $p < 0.001$). The number of subjects that had never consumed alcohol declined with years of study, falling from 56.9% to 20.0% ($\chi^2 = 14.9$, $p < 0.001$) in year 1 to year 6, with a corresponding increase in the number of current smokers (Fig. 2).

Alcohol consumption did not influence awareness about smoking-related diseases (73.9% of never-drink-alcohol students agreed there was strong evidence about smoking-related morbidity vs. 65.2% of students who drink alcohol, $p > 0.05$), nevertheless, no-alcohol students were more reas-

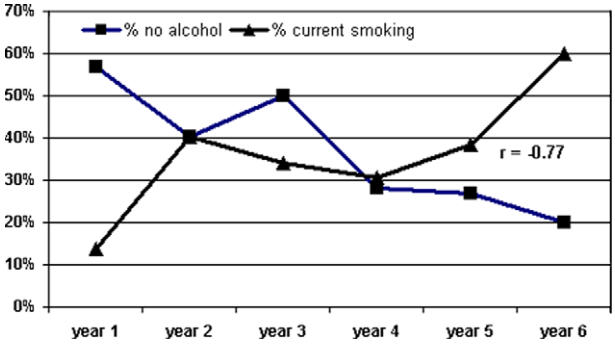

Fig. 2 Numbers of current smokers and alcohol use.

sured there was need to give advice (90.4% vs. 80.1%, $\chi^2 = 4.9$, $p < 0.05$). They were in greater demand for additional information on smoking-related morbidities (80.9% vs. 69.6%, $\chi^2 = 4.7$, $p < 0.05$) and were more committed to participate in anti-tobacco activities (67.8% vs. 55.6%, $\chi^2 = 4.2$ $p < 0.05$).

Discussion

The prevalence of smoking among health care providers has been shown to vary widely [4]. In a series of studies undertaken by the International Union Against Tuberculosis and Lung Disease (IUATLD) along with WHO, 9000 medical students from 42 countries were surveyed [11,12]. Central Asian countries were not included in these surveys, however some data became available from a separate study in Tashkent [5]. In the majority of these studies, it was shown that Asian students smoked less compared to Europeans [13–20]. In our study self-reported smoking rates were very high among year 6 male students (85.7%), ranking as the highest prevalence rate in the country. The 2005 adult survey showed smoking prevalence varying from 1.7% among women to 41.4% among men in the age group 15 years and older, the overall adult prevalence rate being 20% [2]. Unfortunately, there have not been any studies on the prevalence of smoking among physicians in Kyrgyzstan, however if we assume that smoking continues after graduation, then physicians appear to have the highest rate in the population.

Biochemical validation enabled us to detect students who reported not smoking but who had high CO levels. The proportion of these students changed from year to year reaching a peak in year 6, where 27.8% of self-reported no- or ex-smokers had CO levels $\geqslant 7$ ppm. To the extent that we could consider other sources of CO unlikely, the major reason for increased levels of exhaled CO was ongoing smoking.

Although not as accurate as cotinine analyses, exhaled CO measurement was used in our study because of its lesser cost and because the former was not readily available. One might expect that the real prevalence of smoking would have been even higher with the use of cotinine analyses, particularly as CO retention tends to be low [8,21].

Both the high prevalence of smoking and the low level of awareness about smoking-related diseases were surprising findings in this study of future physicians, who are expected to initiate, design and implement smoking cessation programmes [4]. The number of medical students who were confident that smoking had a distinct relation with chronic diseases and especially lung cancer was relatively low. This indicates deficient education. Curricula on the management of tobacco use have been demonstrated to be inadequate even in the majority of developed countries [4,22–24]. Action is needed urgently to equip medical students with the necessary skills. Moreover, education on smoking-related illnesses results in a more positive perception by medical students about counseling in the future [19].

Likely the high prevalence rates of smoking explain the doubts future smoking cessation counselors have towards their counseling practice. Although 85% of medical students believed advice should be given to every smoker to stop, only 63% believed that this advice is effective. This likely reflects a low level of awareness. Surprisingly, non-smokers did not indicate a higher level of confidence, which suggests that smoking itself was less important than the lack of knowledge, which in turn reflects a defective medical education.

In conclusion, during the time period of this study, the prevalence of smoking among medical students increased such that by year 6 it peaked at 60% (85.7% men and 58% women). The current curriculum does not satisfy students' expressed need for information on smoking-related morbidities, options for smoking cessation and on the demands of the FCTC. Such information will allow future physicians to help their smoking patients quit and may help prevent their own uptake of smoking.

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The authors declare no competing interests.

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