

Tobacco smoking habits among Chinese medical students and their need for health promotion initiatives

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Although the community smoking rate within most industrialised countries is undergoing a continuous decline, in developing regions it is actually increasing by around 3% per year.^{1,2} China represents one such area where tobacco use has boomed, largely because of an increasingly affluent society and aggressive marketing by tobacco companies. It is now the world's largest consumer of tobacco and tobacco-related products, with more than 300 million regular smokers.³ The community smoking rate has risen to alarming levels, with around two-thirds of adult males being current smokers.⁴ China's smoking epidemic is also worsening, with more people taking up the habit at younger ages and consuming greater quantities of cigarettes per day.⁵ Tobacco has become a major cause of death in this country, with lung cancer rates increasing at approximately 5% per year¹ and about half of China's 300 million smokers predicted to die from tobacco-related diseases in future.⁶

Health promotion will be a key factor in combating this epidemic. As the next generation of Chinese physicians and the medical students who follow them will be at the forefront of any such initiatives, it is imperative that they become role models for appropriate health behaviour. Despite this fact, tobacco smoking has not been well studied among Chinese medical students, particularly those in rural areas. Although the World Health Organization lists the smoking prevalence among medical doctors at around 61% for males and 12% for females,⁴ it is unclear whether medical students smoke at similar levels. As successful health promotion initiatives should be specifically targeted to meet the personal, social and cultural needs of the target group, accurate information on their demographic is essential. The objective of our study, therefore, was to investigate the epidemiology of tobacco smoking among medical students in Shijiazhuang City, Hebei Province. Results may then be generalised to the wider population of medical students throughout mainland China.

Ethical approval was obtained from appropriate ethics committees and the study was undertaken in accordance with ethical protocols relevant to mainland China. Data were gathered by means of a self-reporting questionnaire adapted from other investigations.⁷⁻¹⁶ The English version was translated by a panel of bilingual medical professionals, before being back-translated and checked against the original. It consisted of a simple

tick-box format, with questions focusing on current and previous tobacco smoking, number of cigarettes smoked per day and total duration of smoking, as well as basic demographic items such as age and gender. Questionnaires were distributed to a convenience sample of medical students in Shijiazhuang City (approximately 280 km south-west of Beijing) during lecture periods and collected at the end of each session. There were no penalties or rewards for participation, and informed consent was implied if questionnaires were completed and returned. Due to the high initial response rate, a reminder was not required. Data were entered into a spreadsheet program and analysed by statistical software. Basic statistics were calculated, with smoking prevalence rates evaluated by gender and stratified by age. Differences in age-related smoking rates (p for trend) were established using the chi square test. Computed 95% confidence intervals (95% CIs) were also established for smoking prevalence rates. Figures for smoking duration and severity were calculated as percentages of all students who answered those particular questions.

We received 207 completed questionnaires from a total group of 224 medical students, yielding a high response rate of 92.4%.

Table 1: Tobacco smoking habits among Chinese medical students (n=207).

	%	95% CI ^a
All students		
Never smoked	91.8	87.2-94.8
Current smoker	6.3	3.7-10.4
Previous smoker	1.9	1.0-4.9
Males only		
Never smoked	82.5	73.7-88.8
Current smoker	13.4	8.0-21.6
Previous smoker	4.1	1.6-10.1
All smokers		Median
Smoking rate ^c	3.0 smokes per day	
Smoking duration ^c	2.5 years smoking	
Quit smoking ^d	7.0 years ago	
	n	% ^b
Smoking rate		
1-2 per day	2	15.4
3-5 per day	8	61.5
>5 per day	3	23.1
Smoking duration		
1-2 years	4	30.8
3-4 years	7	53.8
>4 years	2	15.4
Smoking by age^e		
20-21 years	2	6.1
22-23 years	7	4.4
24-26 years	4	36.4

(a) Computed 95% confidence intervals for prevalence rates.

(b) Percentages calculated as a proportion of students who answered each question.

(c) Current smokers.

(d) Ex-smokers.

(e) Statistically significant differences in smoking prevalence by age range evaluated using the chi-square test (p for trend = 0.0001).

There were slightly more males than females (53.1% vs. 46.9%) and their average age was 22.3 years. The overall prevalence of smoking was 6.3% (95% CI 3.7-10.4), with a further 1.9% being ex-smokers (95% CI 1.0-4.9). There were no female smokers when stratified by gender, although the prevalence among male students was 13.4% (95% CI 8.0-21.6). Of those who smoked, the median number was 3.0 cigarettes per day, for a period of 2.5 years. Of the 1.9% of students who were ex-smokers, the median time passed since quitting was 7.0 years. The majority of smokers (61.5%) smoked 3-5 cigarettes per day, with the most common duration (53.8%) being 3-4 years. Smoking rates varied significantly by age (p for trend = 0.0001), with students younger than 22 years having the lowest prevalence (6.1%). Although they only accounted for 5.4% of the entire group by number, the highest smoking prevalence was seen among students aged 24 to 26 years (36.4%). Over half of all smokers (53.9%) were aged between 22 and 23 years.

The overall smoking prevalence among male medical students was around 13%, which is higher than other investigations conducted in Australia⁷ and Egypt,⁸ where between 2% and 3% of male medical students smoked. On the other hand, their smoking rate was lower than previous studies conducted in a variety of countries such as Holland,⁹ Kenya,⁸ Colombia,¹⁰ Turkey,¹¹ Albania,¹² Japan,¹³ Tuscany¹⁴ and Russia,⁷ where the prevalence among males ranged from 19% to 48%, and 16% to 25% among females. When compared with population data from the World Health Organization (WHO),⁴ it appears that Chinese medical students smoke tobacco (13% in men, 0% in women and 6% overall) at a much lower rate than the community in which they live (67% in men, 4% in women and 36% overall).

It is interesting to contemplate why smoking rates among medical students differ from the surrounding community. When considering physicians who have already graduated, previous research suggests that their comparatively low smoking rates may be attributed to some key factors. Doctors probably understand the 'medical' message more quickly, there may be an intrinsic conflict between being a health care provider and undertaking unhealthy behaviours, and finally because smoking usually gains a negative image in the medical profession long before it does so in the wider community.¹⁷ As such, the rate of smoking among physicians in a particular country seems to reflect the maturity of its smoking epidemic, with a 'mature' epidemic occurring when the rate among physicians falls below that of the community.¹⁷ None the less, it is possible that Chinese physicians and medical students may not see themselves as role models for healthy behaviour. A previous study by Ohida et al.¹⁸ suggested this might already occur among their Japanese counterparts, and may help explain the relatively high smoking rates seen among Japanese physicians. If so, health promotion

activities for Asian medical professionals will need to consider the social and cultural aspects of cognitive dissonance in this region.

When stratified by gender, we found that there were no female smokers at all, which is similar to other Asian investigations conducted among medical graduates in Malaysia¹⁵ and Hong Kong.¹⁶ This finding may suggest a cultural or societal reluctance to smoke among Asian females. Tobacco smoking may be viewed by Chinese people as being an inappropriate behaviour for women, although this cultural phenomenon seems to vary by geographical location. Either way, with such a low smoking rate, female physicians and their undergraduate counterparts would seem to be ideally placed to lead anti-smoking health promotion initiatives within the Asia-Pacific region. As females continue to bear the burden of child-rearing responsibilities within many Asian societies, they may also incur an additional reluctance to smoke for the sake of their children and/or unborn babies. Again, this represents an important cultural factor that should be exploited to help meet China's smoking epidemic. Aside from advertising health promotion initiatives in Chinese language, it may also be useful to utilise specific Chinese characters and Confucian ideals that resonate strongly with Asian women.

Age represents another consideration when planning health promotion interventions for Chinese medical students. In the current study, we found that older students had the highest smoking prevalence when stratified by age. This is similar to some previous research conducted among physicians in the Netherlands,⁹ where higher smoking rates were seen in the older age groups. Dekker et al.⁹ suggested that it may be due to a 'generational effect' as the social climate of a country changes with respect to tobacco. Such a hypothesis may also be appropriate in China, although further research will be needed to establish this fact. The median number of cigarettes smoked per day during our study was three, which is much lower than the Chinese national average (10 for women and 15 for men),⁵ and certainly very encouraging in its own right. This finding is, however, contrary to a previous study of Dutch physicians and medical students, where students smoked the highest number of cigarettes per week.⁹ Why our medical students consume relatively few cigarettes per day is difficult to understand, although it suggests that health promotion interventions to help them quit may be successful as the possibility of severe physical addiction is probably not very high.

Overall, this study suggests that health promotion interventions are now required among Chinese medical students. China's smoking epidemic is fast becoming a serious public health concern, which in turn represents an important consideration for the medical profession, particularly the next generation of doctors who must lead the way in tobacco-cessation activities

and other forms of anti-smoking health promotion. The fact that some medical students continue to use tobacco suggests that high smoking rates can probably be expected in the next generation of young Chinese. A key facet in controlling this issue must come from the Chinese medical association and the central government, which should now be lobbied to introduce a focused and sustained anti-smoking campaign among young people. As 6% to 13% of Chinese medical students appear to be smokers, their demographic may be a perfect starting point for any such health promotion initiatives.

References

- Chelala C. Tobacco corporations step up invasion of developing countries. *Lancet*. 1998;(351):889.
- Boutayeb A, Boutayeb S. The burden of non communicable diseases in developing countries. *International Journal for Equity in Health*. 2005;(4):2.
- Yang G, Fan L, Tan J, et al. Smoking in China: Findings of the 1996 National Prevalence Survey. *J Am Med Assoc*. 1999;(282):1247-53.
- Mackay J, Eriksen M. *The Tobacco Atlas*. World Health Organization, Geneva, 2002. Available from: <http://whqlibdoc.who.int/publications/2002/9241562099.pdf> [cited 2005 May 30].
- Mackay J. Beyond the clouds – Tobacco smoking in China. *J Am Med Assoc*. 1997;(278):1531-2.
- Lam TH, He Y, Li LS, et al. Mortality attributable to cigarette smoking in China. *J Am Med Assoc*. 1997;(278):1505-8.
- Tessier JF, Fréour P, Nejari C, Belougne D, Crofton JW. Smoking behaviour and attitudes towards smoking of medical students in Australia, Japan, USA, Russia, and Estonia. *Tob Control*. 1993;(2):24-9.
- Tessier JF, Fréour PP, Nejari C, Belougne D, Crofton JW. Smoking behaviour and attitudes of medical students towards smoking and anti-smoking campaigns: A survey in 10 African and Middle Eastern countries. *Tob Control*. 1992;(1):95-101.
- Dekker HM, Looman CWN, Adriaanse HP, Van Der Maas PJ. Prevalence of smoking in physicians and medical students, and the generation effect in the Netherlands. *Soc Sci Med*. 1993;(36):817-22.
- Rosselli D, Rey O, Calderon C, Rodriguez MN. Smoking in Colombian medical schools: The hidden curriculum. *Prev Med*. 2001;(33):170-4.
- Kocabas A, Burgut R, Bozdemir N, et al. Smoking patterns at different medical schools in Turkey. *Tob Control*. 1994;(3):228-35.
- Vakefliu Y, Argjiri D, Peposhi I, Agron S, Melani AS. Tobacco smoking habits, beliefs, and attitudes among medical students in Tirana, Albania. *Prev Med*. 2002;(34):370-3.
- Kawane H. Smoking among Japanese physicians. *J Am Med Assoc*. 2001;(286):917.
- Melani AS, Verponziani W, Boccoli E, et al. Tobacco smoking habits, attitudes and beliefs among nurse and medical students in Tuscany. *Eur J Epidemiol*. 2000;(16):607-11.
- Yaacob I, Abdullah ZA. Smoking habits and attitudes among doctors in a Malaysian hospital. *Southeast Asian J Trop Med Public Health*. 1993;(24):28-31.
- Cheng KK, Lam TH. Smoking among young doctors in Hong Kong: A message to medical educators. *Med Educ*. 1990;(24):158-63.
- Davis RM. When doctors smoke. *Tob Control*. 1993;(2):187-8.
- Ohida T, Sakurai H, Mochizuki Y, et al. Smoking prevalence and attitudes toward smoking among Japanese physicians. *J Am Med Assoc*. 2001;(285):2643-8.

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