The Collaborative Funding Program for Southeast Asia Tobacco Control Research

TOBACCO USE AMONG VIETNAMESE MEDICAL STUDENTS HEALTH PROFESSIONALS

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SEATCA

SOUTHEAST ASIA TOBACCO CONTROL ALLIANCE

Southeast Asia Tobacco Control Alliance (SEATCA)

Under The Collaborative Funding Program for Tobacco Control Research

Tobacco Use among Vietnamese Medical Students and Health Professionals

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Executive Summary

Tobacco smoking is a global public health issue. It exists everywhere, both in the developed and developing countries, requiring special attention from the whole society, not only health sector to help curtail use and promotion. In Vietnam, very high smoking rates among different sub-populations have been challenging public health researchers and tobacco control implementers. However, no studies have focused on smoking among Vietnamese health care providers. Despite being non-smoking exemplars, many health care providers in many countries including Vietnam, do smoke, posing a great concern for government health officials and advocates. Smoking among health care providers may diminish as tobacco control policies are put in place and smoking cessation is readily available, thus affecting smoking practice at workplace and patients' smoking behaviors. This study, therefore, will investigate smoking patterns among Vietnamese medical students and health professionals, and examine their smoking knowledge, beliefs, attitudes and practices.

This is a cross-sectional study, employing both qualitative and quantitative methods, on a sample size of 4,701 medical students and 2,151 health workers from the three largest hospitals of the three main regions of Vietnam - North, Center and South. Two self-administered structured questionnaires were used to collect data, one for medical students and the other for health workers. Descriptive and inferential statistical tests were applied in data analysis.

The findings revealed that the smoking rate among medical students was much higher than that among health workers (25.5% versus 13.4%). Despite a not so high smoking rate of health professionals, it is different by age, sex and region. Smoking rate was highest in the 30-39 age group, and in the North, and lowest in the South. Males smoked much more than females. Physicians smoked more than other health care provider groups (nurses, dentists, and others). For medical students, males also smoked much more than females, and increased by a rise in age group and academic year. Although smoking rates among medical students and health professionals were not high, their extent of smoking was alarming (nearly 10 cigarettes/day, and over 50% of both respondents smoked everyday). The qualitative studies showed that the reason for smoking was mainly attributed to habits and addiction, and females smoked less than their male counterparts because it is customary that smoking among Vietnamese women is socially unacceptable, except for Hue city-based women. In general, both respondents had a good knowledge of

smoking hazards. However, medical students had a better perception of passive smoking than that of active smoking (over 91% vs nearly 87%), but the opposite applies for health professionals (over 67% vs a bit over 99%). Interestingly, medical students' beliefs in hazards of smoking and their attitudes towards smoking control were closely associated with smoking behaviour, and not knowledge. There was a big gap between health care providers' knowledge on, beliefs in, attitudes towards smoking and their practice of quitting (good at knowledge and bad at practice of quitting). There was a robust relationship between health professionals' knowledge and their smoking behaviour. Noticeably, students' exposure to smokers was closely linked with smoking behaviour. Medical students' costs for smoking were relatively high against their living costs. Students' access to anti-tobacco messages was largely via TV (around 44.4%, on average), while that to schools was modest (about 9% on average). Health professionals' need for more training in anti-tobacco information was great, and their recommendations for reducing smoking drew upon mainly health education and putting tobacco control policy and law into practice.

The above findings should inform policy making body for tobacco control in Vietnam. If these controls are successful, more health care providers are projected to quit smoking, as well as not to start smoking.

Introduction

Smoking among general population: patterns

Tobacco smoking has been well documented as a global health issue. According to Fiore, smoking is one of the leading causes of preventable illness and death and is the fifth sign of life-threatening diseases. [1] By the year 2030, it is estimated that people who smoke cigarettes may die earlier than those who do not smoke, and that the death rate of smokers will be one-sixth of smokers, or 10 million death cases a year.[2] Around 80% of American adults who smoke started smoking before they were 18 years old, and almost 3000 people under 18 years of age become regular smokers every day.[3] In 2002, 27% of the Eastern African population [4] and almost 28% of Australian men and 23% of Australian women [5] smoked. In 2001, 52.7% of men and 11.6% of women in Japan smoked.[6] In 1999, over 34% of both men and women in China were smokers.[7] Korea and the Philippines, in turn, reported smoking rates among men to be 67% and 60% respectively.[8] Over 71% of the Thai population smoked in 2001.[9] Most notably, in 2002, Indonesia witnessed a staggering 89% smoking rate among young men under 20 years of age.[10] These rates indicate that in the Western Pacific Region, smoking rates among the general population are very high.

Smoking among health-care providers: patterns

While health-care providers are expected to be role models for their patients, in many countries many of them smoke cigarettes. According to a study by Crofton and Tessier, 38% of male doctors, 25.6% of female doctors and 49% of nurses were tobacco smokers.[11] Another study, this one undertaken in Holland, yielded similar results: 37% of male doctors and 14% of female doctors were smokers.[12] Further, a 20% rate of smoking among medical doctors in Saudi Arabia was found in a 2000 WHO survey.[13] In China, the smoking rate among physicians was very high: 50.9% of the male physicians and 4.8% of the female physicians were smokers.[14] Also, a study by Nagle et al. showed that 22% of Australian nurses were smokers and 21.5% were ex-smokers.[15] As smoking rates among different subpopulations are indicators of public health problems, WHO has made prevention programs a priority.[2]

Likewise, smoking among medical students is also common. A study by Vakeflliu et al. showed that, in Albania, 55% of male medical students and 34% of female medical students in their fifth year of medical school were smokers.[16] Similarly, in Italy, 30% of medical students in Tuscany were

smokers, as found by Melani et al.[17] Further, U.S. and U.K. surveys revealed that almost 50% of nurses smoked while they were students.[18,19] A study by the International Unit Against Tuberculosis and Lung Diseases (IUATLD), in collaboration with WHO and the American and International Anti-Cancer Unit revealed that among 9000 students from 51 medical universities in 42 countries, tobacco smoking prevalence varied remarkably from 0.5% to 56.9% in males and from 0% to 47% in females.[20]

Influence of smoking behaviour among health-care providers on their career and patients

Due to the nature of their work and their influence on patient behaviour, health-care providers, including health professionals and medical students, are expected to be role models for patients. Health-care providers have frequent and direct contact with patients and play an important role in providing health care and health education to patients. Therefore, they are a credible source of health information by patients.[21] One of the key roles of health-care providers is to provide patients with advice on smoking cessation. Health-care providers who smoke while also giving smoking cessation advice may adversely affect the beliefs, attitudes and behaviours of smokers.

When health-care providers are smokers, their advice is less valid for patients. Mausner emphasizes that nurses and doctors who advise patients to stop smoking while their own ashtrays contain cigarette butts cannot be convincing.[22] Also, Dore and Hoey strongly argue that health-care providers' smoking behaviours may diminish their willingness as smoking cessation care providers, affecting both their practice at the workplace and their patients' smoking behaviours.[23] Beyond that, nurses and doctors who smoke tend to give patients less advice on smoking cessation than those who do not smoke.[24] Therefore, health-care providers should be encouraged to recognize the importance of their smoking behaviours at the workplace so that their practice can be effective. In addition, smoking rates among health professionals and medical students should be examined as the behaviour of health professionals and medical students can have a direct effect on patient bahaviour.

Smoking among Vietnamese subpopulations and health-care providers

Although many studies have investigated smoking among different subpopulations in Vietnam, none has focused on smoking among health professionals and medical students. Gillman et al. revealed that 73.4% of Vietnamese men and 4% of Vietnamese women smoke.[25] In 1997, Jenkins et al. revealed similar results with a 72.8% smoking rate among men and a

4.3% smoking rate among women in Vietnam.[26] The New York Times reported that the smoking rate among men in Vietnam was one of the highest in the world.[27] Dai's research showed that 72% of Hanoi car factory workers, 75.9% of teachers and 52.7% of students in Vietnam smoked.[28] Research by Phong et al. indicated the smoking rate among Hanoi-based artists to be greater than 30%.[29] A survey by the Vietnam and Swedish Health Cooperation Programme (VSHCP) indicated that over 20% of Vietnamese university students smoke.[30] Recently, the result of the 2001-02 Vietnam National Health Survey revealed that over 50% of the male population and nearly 2% of the female population in Vietnam smoke.[31] The above survey results indicate that smoking among various subpopulations in Vietnam is very high.

Rationale for studying smoking among Vietnamese health-care providers and medical students

There are a number of vital reasons for investigating smoking among health-care providers and medical students in Vietnam. First, despite studies showing very high smoking rates among Vietnamese subpopulations, none has focused on smoking among Vietnamese health-care providers. Second, although health-care providers are expected to act as non-smoking exemplars for their patients, smoking rates among them are high in many countries. Finally, smoking behaviours among health-care providers may diminish their willingness as smoking cessation care providers, affecting their practice and their patients' smoking behaviours.

This study will investigate smoking patterns among Vietnamese health professionals and medical students, and examine their knowledge, beliefs, attitudes and practices about smoking. The results will be a tool for policy makers debating tobacco control measures.

Methods

Setting, sample and procedure

The study was conducted at the three largest medical universities and the three largest hospitals from the three main regions of Vietnam: Hanoi Medical University and Bach Mai Hospital in the North, Hue Medical University and Hue Hospital in the Central region and Can Tho University and Can Tho Central Hospital in the South. All students from the first to the sixth academic year were eligible to participate in the study, and all types of health professionals were also included in the study. A total of 7220 medical students and health-care providers, both male and female, were given the anonymous, self-administered questionnaires along with detailed instructions for completing the questionnaires individually. The questionnaires were distributed to the respondents during breaks from lectures or work. The respondents were required to complete the questionnaires on site and return them immediately to the research team. No incentives were provided to complete the questionnaires. Of the 7220 respondents, 6852 completed and returned their questionnaires, resulting in a 95% response rate.

Further, qualitative studies were also taken at the three universities and three hospitals after the completion of the quantitative studies. The qualitative methods used were in-depth interviews of leaders at the universities and hospitals (12 interviews) and group discussions with students and key health professionals (five discussions).

Instruments

The questionnaire to investigate tobacco use among medical students was an adaptation of the Global Youth Tobacco Survey Questionnaire, and the questionnaire to investigate tobacco use among health-care providers was the WHO Questionnaire for Global Tobacco Use Survey Among Health Professionals. The former questionnaire was composed of six key parts: personal information, knowledge and attitudes, tobacco use behaviour, exposure to smokers, access to tobacco information, and access to anti-tobacco health education at the medical universities. The latter questionnaire was composed of four parts: demography, tobacco use behaviour, knowledge and attitudes, and workplace practices.

The qualitative research tools were two guidelines (one for in-depth interviews and one for group discussions) developed with the support and advice of international experts from the Institute for Global Tobacco Control, Johns Hopkins Bloomberg School of Public Health, in the United States.

Data collection and analysis

Trained researchers gathered both the quantitative and qualitative data. These researchers received training on survey methods from experienced experts. Experienced experts are professors and PhDs in public health with seniority of research from Hanoi Medical University. During the survey administration, researchers were available on site to answer questions posed by the respondents.

Data were input by using EPI-INFO (version 6.04, my study analysis used Vrs 6.04, although there are many versions), then transferred into STATA (version 7.0) for calculations of statistical values and tests [%, mean (x), X^2-test, Yates's corrected X^2-test, t-test (or ANOVA), correlation analysis, confidence interval (CI) and p-value]. These calculations served as a basis for the analysis and interpretation of the findings. The statistical significance yielded was *P<0.05*. Any data, after statistic tests used, had p-value of under 0.05, despite t-tests, Anova-tests, Chi-square tests.

Results

Sample characteristics

The respondent characteristics are shown in Table 1. The response rate of medical students reached 99.5% and that of health-care providers was 86.04%. A total of 4701 medical students and 2151 health-care providers completed the questionnaires. In general, the respondents all actively participated in this study. Male medical students comprised 55.09% of the respondents, slightly higher than their female counterparts. By contrast, the rate of males in other health professionals was only 34.2%, compared to their female counterparts, who accounted for 65.8% (p<0.001). The sample of students was divided into three age groups: 19 and under, 20-24, 25-30. Respondents in these groups accounted for 12.55%, 76.18%, and 11.27%, respectively. The sample of health professionals was broken into five age brackets: 20-29, 30-39, 40-49, 50-59 and 60-69 (comprising 22.5%, 35.3%, 27.6%, 14.3% and 0.3%, respectively). The surveyed medical students included all six academic years: first year (22.55%), second year (18.27%),

Table 1: Respondent characteristics

Medical students		Health professionals	
Variables	N=4701 (%)	Variables	n=2151 (%)
Sex[a]		Sex[b]	
Male	2586 (55)	Male	736 (34.2)
Female	2115 (45)	Female	1415 (65.8)
Age groups			
19 and under	592 (12.6)	20-29	484 (22.5)
20-24	3582 (76.2)	30-39	759 (35.3)
25-30	527 (11.2)	40-49	
		50-59	307(14.3)
		60-69	8 (0.3)
Academic year			
1st year	1060 (22.5)	Medical doctors	730 (34)
2nd year	859 (18.3)	Nurses	993 (46)
3rd year	662 (14.1)	Dentists	18 (0.9)
4th year	647 (13.8)	Others	410 (19.1)
5th year	871 (18.5)		
6th year	602 (12.8)		

[a]X^2 test-based p-value<0.001

[b]X^2 test-based p-value<0.001

third year (14.08%), fourth (13.8%), fifth year (18.53%) and sixth year(12.81%). The health professionals included in this study were medical doctors, nurses, dentists and others, which, in turn, accounted for 34%, 46%, 0.9% and 19.1%.

Table 2 depicts a pattern of tobacco use among medical students in terms of sex, age group, academic year, and among health professionals in terms of sex, age bracket and professional position. The figures show that the rate of smoking among medical students is almost twice that of health-care providers (25.5% versus 13.4%, p<0.001).The second feature worthy of comment was that males smoked extremely more than females, over 20 times (p<0.001), and when it was adjusted by sex (in Table 2, lines 6 and 7), the rate of smoking among medical students and health professionals was the same by sex - males about 36% (among male health professionals) versus 44% (among male students), and females 1.8% (female health professionals) to 2% (female students). By age groups, students aged 25-30 were the heaviest smokers, accounting for more than 44%, perhaps reflecting that students tended to smoke more during the final years of their university life (p<0.001). By contrast, health professionals often smoked more at the middle of their career as health-care providers; to be specific, health care-providers aged 30-39 ranked

Table 2: Rates of smoking by sex, age group, and academic year

Medical students		Health professionals		X2 test-based p value
Variables	n=4701 (%)	Variables	n=2151 (%)	
*Current smokers	1197 (25.5)	*Current smokers	289(13.45)	P<0.0001
*Sex		*Sex		P<0.0001
Male	1157(44.7)	Male	264(35.9)	
Female	40(2.0)	Female	25(1.8)	
*Age group[a]		* Age groupa		P[a]= 0.000
<=19	50 (8.4)	20-29	44 (9.1)	
P[a1]=0.02				
20-24	913 (25.5)	30-39	127(16.7)	
25-30	234 (44.4)	40-49	79(13.3)	
		50-59	38(12.4)	
*Academic year[b]		60-69	1(12.5)	
1st year	135 (12.7)			
2 nd year	213 (24.8)	*Position[b1]		P[b]=0.000
3 rd year	174 (26.3)	Doctor	168(23)	
4 th year	157 (24.3)	Nurse	76(7.7)	
P[b1]=0.000				
5 th year	310 (35.6)	Dentist	4(22.2)	
6 th year	218(36.2)	Others	41(10) 40-49	

as the number one cigarette users, accounting for 16.7% (p<0.05), followed by the age group (p<0.05). Most interestingly, the tobacco use rate of students tended to increase across their academic years, from 12.7% in the first year to 36.25% in the final year; there was a highly significant difference in the rate of tobacco use among students over the academic years (p<0.0001). Medical doctors, who are expected to act as role models for their patients, were found to smoke the most (23%), followed by dentists (22.2%) and nurses (7.7%) (p<0.0001).

Current smokers (at least 1 cigarette /day), age group for students was split into 3 groups - at beginning of, middle of ,and nearly the end of medical study; and for health professionals into 4 groups - early, semi-middle, middle, and elderly age group; academic year includes 6 years from year 1 to year 6 according Vietnamese Education System. Smoking rates by sex, and age group and academic year mean current smoking rates according to these characteristics.

The information gathered from the in-depth interviews and group discussions:

"The reason for a greater smoking rate of males over females is traditional aspect; Vietnamese women, except for the elderly in Hue city, often do not smoke cigarettes ..."

"The reason for a greater smoking rate among older people over younger ones is out of family's control, having more friends, mutual imitation and impression of sophistication". This is cited from qualitative research, in-depth interviewing respondents (leaders of hospitals). Therefore, this statement could be deleted in this part.

The extent of smoking among medical students and health-care professionals is shown in Table 3. Both medical students and health-care providers reported smoking the same average number of cigarettes a day, 8.4-9. Nearly 41% of health-care providers have smoked between 1-10 years, whereas the number of smoking years among medical students mounted to 8.5 years. As smoking rate of students aged 20-24 years was high (25.5%), this could imply that medical students started smoking at a very early age. Almost two thirds of medical students who smoke do so every morning, and 100% of health-care providers who smoke are frequent smokers. The data also reveals that the rate of medical students who have ever tried to quit smoking is relatively high (75.7%). 60% of medical students had intentions to quit smoking within the next 12 months. Health-care providers started to smoke at the beginning of their career (22.4 years old on average); nevertheless, many of them may have smoked earlier.

Table 3: Smoking habits or extent of smoking

Medical students		Health professionals	
Variables	n=4701 (X_SD)	Variables	n=2151 (%) or (CI)
Average number of cigarettes smoked a day	1184 4.4_4.1	Average number of cigarettes smoked a day Mean (CI)	8.9 (CI=6.9-8.10)
Number of smoking years	1189 8.5_7.6	Number of smoking years 1-10 years 11-20 21 or over	118 (40.8) 101(34.9) 70 (24.3)
Average number of smoking days in a month	1182 15.6_8.9	Extent of smoking Daily smoking Occasional smoking	72 (51.5) 68 (48.5)
Smoking habits every morning[a]	1188 716 (60.3%)	Average age of use start	22.4 (mean) (CI=22-23)
Ever tried to quit smoking[b]	1188 899 (75.7%)		
Intention to quit in next 12 months[c]	1171 703(60.0%)		

[a,b,c]Variables are calculated as % and the 1st line of each variable is the number of students who smoked and returned questionnaires and the 2nd line is the number of students who answered "yes", and the bracketed numbers are %.

[a1]p value<0.001 based on X^2 test.

Table 4 shows that the rate of smoking among medical students' family members and friends was high. Almost 74% of family members and 89.4% of friends of those students who smoke are also smokers. The rate of smoking among non-smokers' family members and friends was much lower than that

Table 4: Rates of smoking among medical students' family and friends

Variables	n=4701 (%)	X2 test- based p value
*Smoking among students'family members Smokers	884 (73.9)	P<0.001
Non-smokers	2094 (59.8)	
Total	2978 (63.3)	
*Smoking among students' friends Smokers	1070 (89.4)	P<0.001
Non-smokers	1870 (53.4)	
Total	2940 (62.5).5)	

among smokers' family members and friends. This difference was statistically significant (p<0.001). This suggests that those family members and friends who smoke influence the smoking behaviour of medical students.

Table 5 shows that 86.9% of medical students are aware that smoking is harmful to their health; however, it is interesting to note that their awareness of the health hazards of secondhand smoking was higher (91.1%) than that of the hazards of smoking. The difference yielded a significant level of probability (P<0.0001) compared to 2 percentages for knowledge about smoking among students (chi-square tests)

Table 5: Medical students' knowledge about hazards of tobacco use

Variables	n=4701 (%)	X2 test-based p value
Smoking is harmful to health	4083 (86.9)	P=0.0000
Secondhand smoke is harmful to health	4282 (91.1	

As seen in Table 6, students' knowledge of the health hazards of smoking did not influence their smoking behaviour (OR <1 and CI contains 0 value). However, it was apparent that their attitude and belief were closely associated with their smoking behaviour, indicating the odd ratios of 3.9 and 9.4, respectively (p<0.001 and CI did not contain value 0).

Table 6: Correlation between knowledge, belief, attitude and smoking behaviour

Correlates	Smoking (n)	Non-smoking (n)	OR CI, p-value
Knowledge of the health hazards of smoking			
Non-awareness	13	24	0.7(0.3-1.4)
Awareness	1141	1409	>0.05[a]
Attitude towards smoking control			
Negative	857	1366	3.9(3.4-4.6)
Positive	339	2135	<0.001[b]
Belief in hazards of smoking			
Not harmful	16	5	9.4 (3.3-33.1)
Harmful	1151	3499	<0.001[c]

[bc]P-values were based on X^2 tests and [a]p-value was based on Yate's corrected X^2 tests.

Table 7: Knowledge, belief, attitude and practice (KBAP) of health professionals towards tobacco use

KBAP (%) n=656 (%)	North n=749 (%)	Centre n=746 (%)	South p value	X2 test- based
*Knowledge about[K]				
Hazards of active use[K1]	651(99.2)	764(99.6)	742(99.5)	>0.6
Hazards of passive use[K2]	437(67)	581(78)	529(71)	<0.001
*Belief in patients'quitting				
If advised by doctors[B1]	530(81)	636(85)	588(79)	<0.007
If doctors smoke[B2]	453(69)	439(59)	531(71)	<0.001
*Attitude toward				
Preventing from use[A1]	440(67)	547(73)	466(63)	<0.001
Anti-tobacco use[A2]	422(64)	528(71)	471(63)	<0.006
*Practice on				
Trying quitting 1week[P1]	74(54.8)	87(79.8)	32(72.7)	<0.001
Intention of quitting in next months[P2]	24(17.8)	47(43.5)	16(13.4)	<0.001
Intention of quitting immediately[P3]	12(8.9)	15(13.9)	08(18.2)	<0.001
Already quitted[P4]	11(7.9)	08(7.3)	2(3.6)	<0.002

[K]X^2 (to compare the rate of awareness of active and passive smoking hazards) =2.3, p>0.3.

[K1] The question asked was, 'Smoking is harmful to your health?''

[K2]5 questions asked were about the risks of passive smoking on: (1) neonatal death, (2) sudden infant death syndrome during pregnancy smoking, (3) lung diseases in non-smoking adults, (4) heart diseases in non-smoking adults and (5) lower respiratory tract illness (pneumonia) in exposed children' and overall awareness was marked on all these items answered 'yes'.

[B1] The question asked was, 'Patient's chances of quitting smoking are increased if a health professional advises him or her to quit?'

[B2] The question asked was, 'Health professionals who smoke are less likely to advise people to stop smoking?'

[A1]7 questions asked were about (1) 'Health professionals serve as role models for their patients and public?', (2) 'Health professionals should set a good example by not smoking?', (3) 'Health professionals should routinely ask about their patients smoking habits?', (4) 'Health professionals should routinely advise their smoking patients to quit smoking?', (5) 'Health professionals should speak to lay groups about smoking?', (6) 'Hospitals and health care centres should be "smoke-free"?' and (7) 'Health professionals should routinely advise patients who smoke to avoid smoking around children?' and overall attitude was marked on all these items answered 'yes'.

[A2]6 questions asked were about (1) 'Smoking in enclosed public place places should be prohibited?', (2) 'Health warnings on cigarette packages should be in big print?', (3) To-

bacco sales to children and adolescents should be banned?', (4) 'Sport sponsorships by tobacco industry should be banned?', (5) 'There should be a complete ban on the advertising of tobacco products?' and (6) The price of tobacco products should be increased sharply?' and overall attitude was marked on all these items answered 'yes'.

Table 7 compares the tobacco use knowledge, belief, attitude and practice of health-care providers among regions. The rate of health-care providers who have an awareness of active smoking hazards is overwhelmingly higher, at over 99%, than that of passive tobacco use hazards, which is about 70% in all the three regions. This difference in awareness of active and   passive smoking hazards among the three regions is not significant (p>0.3). Roughly 79%-85% of health professionals believe that patients' ability to quit could increase if they were advised to do so by health-care providers, with a significant difference between the regions (p<0.007). From 59%-71% believe that patients' motivation to quit could decline if their health-care provider smokes. Significant difference between the regions was also found with p<0.001.

The attitudes of health-care providers towards prevention and anti-tobacco efforts are similar in all three regions. Interestingly, health professionals' success with quitting was not positive. The number of health-care providers who have tried to quit for one week was relatively high. About two-thirds of health professionals have tried to quit for at least one week; those in the Central region have the highest success rate (79.82%) compared to 72.73% in the South and 54.81% in the North (p<0.001).

Health professionals overall are positive in their intention to quit over the next six months. Health professionals in the Centre region are more positive in their intention to quit in the next six months (43.5%), compared to 17.8% in the North and 13.4% in the South (p<0.001). In contrast, health professionals in the South were more likely to intend to quit immediately (18.2%) while 13.9% in the Centre and 8.9% in the North have the same intention (p<0.001). Those health professionals who have actually quit smoking successfully account for only 6.3%; health-care providers in the North and Center performed better than those in the South (over 7.9% and 7.3% versus 3.6% [p<0.002]).

Table 8: Correlates between awareness of tobacco use hazards and smoking behaviour of health professionals (OR correlation analysis)

Correlates[a]	Smoking (n)	No smoking (n)
Non-awareness	6	6
Awareness	283	1856

OR[a] = 6.56, Yates' corrected X^2=10.9, p = 0.001.

Table 8 demonstrates a close association between the awareness of the hazards of smoking and smoking among health professionals. The smoking prevalence among those who were not aware of smoking hazards was 6.6 times higher than among those who were sufficiently aware (p=0.001).

Table 9 draws upon Table 3 to explore the gap between knowledge, belief, attitude and practice among health-care providers towards tobacco use. Their knowledge of active tobacco use hazards was shown to be better than that of passive smoking and, in particular, is much better than their belief, attitude and practice. All the distributions among the above differences were statistically significant (p<0.001).

Table 9: A gap between knowledge, belief, attitude and practice of health professionals towards tobacco use

KBAP gap	K1 - K2 (%)	K1 - B1 (%)	B1-A1 (%)	A1-P4 (%)
% difference	99.4-71.9 = 27.5	99.4-81.6 = 17.8	81.6-67.6 = 14	67.6-5.9 = 61.7
	X^2=664, df=1, p<0.001	X^2=337.4, df=1, P<.001	X^2=111, df=1, p<0.001	X^2=2116.3, df=1, p<0.001
	K1 ñ P4 = 99.4 ñ 5.9 = 93.5 X^2=4171; df=1; p<0.001			
	Difference between K1, B1, A1 and P4: X2 = 5076 df=3, p<0.001			

Table 10 illustrates a relationship between medical students' exposure to secondhand smoke and their smoking behaviour. Those students who were exposed to smokers were more likely to smoke than those who were not exposed to smokers. Exposure to family members who smoke was a greater

Table 10: Correlation between exposure to secondhand smoke and smoking behaviour of medical students

Correlates[a]	Smoking (n)	Non-smoking (n)	OR CI, p-value
Exposure to family smokers			
Daily	611	806	5.0(3.5-7.1)
Occasional	551	2377	2.2(1.5-3.1)
Seldom	30	319	1.0
Exposure to non-family member smokers			
Daily	253	756	1.6(1.4-1.9)
Occasional	473	1200	1.5(1.3-1.7)
Seldom	233	702	1.3(1.1-1.6)
Never	235	1023	1.0

influence than exposure to smokers outside the family relationship. The rate of smoking among students exposed to family members who smoke is five times higher than that of students whose family members do not smoke, while students exposed to non-family member smokers displayed just a 1.6-fold rate of smoking over those students exposed to non-family members who do not smoke. Those differences were all significant since CI did not hold value 0 and OR>1.

Table 11 illustrates the differences in the cost of smoking for medical students in the three regions. Northern students were shown to have the highest cost of smoking, followed by Southern students. The lowest cost is found among Central region students (P<0.001). The percentage of costs for smoking was found to be the lowest among Southern students, and the greatest among Northern students (P<0.001).

Table11: Costs of smoking among medical students between regions.

Variables n (mean_SD)	North n=2544	Centre n=1085	South n=1072	t test- based P-value
Average cost of purchasing 1 cigarette package[a]	417 7900 _3147	285 9878_3477	114 8179_3875	<0.01
Average cost of smoking a month[b]	450 54000_ 59000	314 43000_ 49500	120 50800_ 54500	<0.001
Average living cost a month[c]	600 551000_ 277000	383 507600_ 183000	201 669000_ 279000	<0.001
Percentage of costs for smoking	450 10.7_11.8%	314 9.2_11.4%	119 8.1_8.2%	<0.001

[abc]Costs are in Vietnamese Dong (VND); 1USD = 15,000 VND

Table 12 illustrates sources of anti-tobacco information that medical students accessed. Television ranks as the number one source of anti-tobacco information, accounting for 33.0% in the South and about 50% in the North and Centre. The second most common source of anti-tobacco information was billboards, posters and leaflets, occupying 11.8% in the Centre and almost 21% in the South and North. The third most common source was newspapers, magazines and books, 12%-13% in the North and Centre and 19.6% in the South. Medical universities ranked fourth as a source of anti-tobacco information. Other sources were found to be less common.

Table 12: Medical students' access to anti-tobacco information

Variables n (%)	North n=2544	Centre n=1085	South N=1072.	X2-based P-value
TV	1276(50.2)	541(49.9)	352(33.0)	<0.001
Radio	82(3.2)	32(3.0)	122(11.4)	<0.001
Billboard, poster, leaflet	532(20.9)	128(11.8)	218(20.5)	<0.001
Newspaper, books	352(13.8)	133(12.5)	209(19.6)	<0.001
Films	17(0.7)	12(1.1)	3(0.3)	<0.05
Social activities	31(1.2)	54(5.0)	28(2.6)	<0.001
Schools	176(6.9)	143(13.2)	86(8.1)	<0.001
Do not notice	46(1.8)	26(2.4)	27(2.5)	>0.05
Other	32(1.3)	16(1.5)	21(2.0)	>0.05

As can be seen in Table 13, it is clear that most health-care providers (86.5%) want to have training in tobacco control. Further, among the recommendations made by health professionals, health education was the most important approach for anti-tobacco information, followed by promulgating policy and law on banning tobacco use at health facilities (38.4%) and training in anti-tobacco measures (24.1%). Other suggestions, such as financial support, a tobacco tax increase and warning labels on cigarette packaging, were far less common.

Table 13: Needs and recommendations of health professionals for reducing tobacco smoking

Characteristic	n=2151(%)	X^2test-based p-value
Need of more training in anti-tobacco approaches	1861 (86.5)	
Recommendations to WHO to reduce smoking		
Financial support	230 (10.7)	P=0.001
Training	518 (24.1)	
Health education	1454 (67.6)	
Tobacco tax increase	194 (9.0)	
Policy and law	826 (38.4)	
Warning of smoking harm on cigarette packs	28 (1.3)	
Others	15 (0.7)	

Summary of Qualitative Findings

The in-depth interviews and group discussions revealed findings similar to the quantitative studies. Specifically, the rate of tobacco use among health-care providers is not high. Hospital leaders attribute the low smoking rates to the high level of understanding of the adverse effects of smoking among health-care providers. Temporary regulations on the restriction of tobacco use were implemented by health professionals in in all 3 hospitals in three regions, but were more strictly enforced in the Centre and South regions than in the North region. Therefore, the smoking rate was found to be lower in these regions. However, the attitude and practice of those health professionals who do smoke are not good; they frequently smoke a lot and some even smoke in their medical offices. In the medical offices where physicians do smoke, there are neither official regulations nor official policies prohibiting the use of tobacco in the facilities. All the hospital leaders suggested that the Ministry of Health write official policies banning the use of tobacco at health facilities. With respect to tobacco use among medical students, the rectors of the three medical universities revealed that a high smoking rate among medical students is still common, even among students who understand the health hazards of smoking. Medical universities still lack strict tobacco use policies.

Medical university leaders acknowledge that smoking among medical students is common. Students smoke for numerous reasons. Among these reasons, habit or nicotine dependence is believed to be the most important causes of smoking. Exposure to friends and relatives who smoke is also a contributing factor. Controlling smoking among students is difficult despite the introduction of some tobacco restriction regulations; these regulations are often not strictly enforced.

Discussion

The data from the present study demonstrate that tobacco use among Vietnamese medical students is more prevalent than that among Vietnamese health professionals. However, if adjusted by sex, the rates are nearly the same. The rate of tobacco smoking among medical students in Vietnam is high compared to some other developing countries, but is lower than in some Western countries. The study reveals that the smoking rate of Vietnamese medical students was 25.5% (24.3%-26.8%), in which the smoking rate of males was nearly 43%-47% and females 1.4%-36%. According to the U.S. Centers for Disease Control and Prevention (CDC), however, tobacco use among Chinese medical male students was just over 21% and among female students was 1.8%.[20] Among male Malaysian medical students, 18.3% smoke, and 0.8% of female medical students smoke. Yes, from CDC source. In Italy, 30% of medical students are smokers (40% of males and 25% of females), and 43% of nursing students are smokers (49% of males and 42% of females).[17] In O'Connor and Harrison's research, over 30% of Canadian nursing students were found to be smokers.[32]

This study also revealed that a 13.5% overall cigarette smoking rate among Vietnamese physicians was not high; it was lower or equal to that found among health-care providers in some other studies. A study found a 22% tobacco use rate among Australian nurses.[15] Also, Han et al. found that 61.3% of male physicians and 12.2% of female physicians in China were smokers[33], compared to 35.6% of male physicians and 1.77% of female physicians in Vietnam found to be smokers in the present study. Nevertheless, a similar smoking pattern exists among male physicians in Vietnam, the Czech Republic and the Netherlands. Gillman et al. reported that 38% of male physicians in the Czech Republic were smokers [25], and Waalkens et al. found that 37% of male physicians smoke.[34]

The comparative rate of tobacco use among Vietnamese health-care providers is not high, but among those who do smoke, 100% smoke frequently. The reason for the low smoking rate of Vietnamese physicians can be explained by a good understanding of the hazards of smoking. It appears to demonstrate a relatively close association between their knowledge and their smoking behaviour. Those who have adequate knowledge about the hazards of smoking have a lower usage rate than those without knowledge. Further, the proportion of females was significantly higher across all health professions, including nurses and dentists, than among medical students. It is also worthy to note that among those health professionals who smoke, they

frequently began smoking at a young age or at the beginning of their career. Medical doctors, who often provide patients with direct care and influence their patients most, were determined to have the highest smoking rates. If nothing is done to curb this trend, more medical professionals may begin to smoke.

While smoking among males has been popular for a long time, smoking among female health-care providers and medical students is a new phenomenon in Vietnam. The rate of male health professionals was far lower than female counterparts (34.2% versus 65.8%), while female medical students occupied 45% in comparison to males 55%; further, it is customary to note that males frequently smoked more than females. Although tobacco use among these samples is still not high, it indicates a change in attitude. In Vietnam, it used to be culturally and socially unaccepted for women, especially those who are medical doctors or medical students, to smoke. The findings of this survey indicate that smoking among women is socially more acceptable now than it was previously. Without intervention, it is believed that more female health-care providers might become tobacco smokers in the future.

Consistent with a rise in the smoking rate of medical students according to age groups, tobacco use by medical students who smoke also tends to increase across academic years. It is lowest in the first academic year and highest in the sixth academic year. Likewise, the lowest proportion of smoking among medical students was found in the 19 and under age group and the highest proportion in the 25-30 age group. The findings of the study suggest that to maximize the ability of students to quit smoking, as well as to minimize the severity of the effects of smoking among medical students, much more attention should be paid to prevention and intervention of tobacco use for students in their first years at university.

Any attempt to reduce smoking among medical students should focus on those factors that determine smoking behaviour of students. This study confirmed a clear difference in the knowledge of, belief in, and attitude toward tobacco use control between students who smoke and those who do not smoke. Those students who did not smoke perceived a 2-3 times higher health risk from smoking than did those who smoked and were particularly aware of the risks of respiratory tract diseases, lung cancers and the harmful effects of secondhand smoking. A question, therefore, has been raised as to whether or not medical students' awareness of the health hazards of smoking influences their smoking behaviour. Among the medical students who smoke, their perception of the health hazards of smoking did not prove to have an influence on their tobacco use behaviour. However, smoking attitudes and beliefs were found to be associated with their smoking behavior.

It seems, therefore, that knowledge of the risks of tobacco use is not a deterrent among those medical students who smoke, and do not influence beliefs and attitudes towards tobacco use control. In his study, Hamadeh also determined that medical students still decided to smoke even though their knowledge of the negative effects of smoking was relatively sufficient.[35] In addition, according to Patkar et al., attitudes toward tobacco control and beliefs about their future roles as health professionals could have become the main contributing factors to reducing tobacco smoking among medical students.[36] The present study also shows that those students who displayed their agreement attitude to smoking smoked 3.9 times higher than those students who did not. Further, medical students who were confident that smoking would be harmful to their health smoked 9.4 times less than those who did not believe in the health risks.

Such interpretations imply that any intervention strategies to stop medical students from smoking should not only target students' knowledge about the health risks associated with smoking, but should also target their belief about and attitudes toward tobacco control. The findings of the qualitative methods of the present study also support this analysis. However, these interventions, in fact, have not succeeded at Vietnamese medical universities. The in-depth interviews and group discussions indicate that medical students' access to anti-tobacco information was predominantly via mass media (television, leaflets, billboard, poster, newspapers, magazines and books), while receiving anti-tobacco information from medical universities is far less common. It is, therefore, essential to run evidence-based health education campaigns to raise awareness about tobacco control at medical universities. Specifically, seminars or workshops on national and transnational studies of the hazards of tobacco smoking should be held because the evidence provided at these seminars has a strong impact on attitudes, beliefs and practices of medical students about tobacco use.

Exposure to other smokers seems to negatively influence the smoking behaviour of medical students. Those students with family members or close friends who smoked were 5-6 times as likely to smoke as those students whose family members and close friends were non-smokers. The findings of the study also show a high prevalance of tobacco use among family members and close friends of those students who smoke. Efforts to minimize smoking among medical students should focus not only on the medical universities where medical students are studying, but also on family environments and settings where students are meeting and communicating with friends.

Economic factors do not appear to influence smoking behaviour among medical students. Students in the Central region demonstrated the highest rate of smoking, while their cost of buying a cigarette package was also the

most expensive. Northern students showed a high level of smoking, while the percentage of costs for their smoking out of their total of overall living costs was found to be the highest. Southern students, however, reported both the lowest smoking rate and the lowest percentage of costs of smoking out of their total overall living costs.

Health-care providers are expected to be role models for their patients and communities. Therefore, their knowledge, belief, attitude and practice have important roles to play in influencing tobacco use by patients and communities. As claimed by Manon and Paccagnella, general practitioners, with their influential role, can change and improve individual health behaviours.[37] The present study showed, however, that while the knowledge of health-care providers was found to be adequate, their beliefs, attitudes and practices against tobacco use proved to be inadequate. Clearly, awareness of the adverse effects of smoking among health professionals was very good, particularly of the adverse effects of active smoking. It was surprising, nevertheless, that attitudes and practices of health-care providers did not correspond to their awareness level. Nagle et al. also found a similar pattern among Australian nurses' knowledge and attitude. In that study, the majority of nurses (98%) perceived that smoking would be harmful to their health, whereas only 13% of them thought that their smoking behaviour was a barrier to providing cessation care to their patients.[15] . An effort to minimize tobacco use among health professionals would likely impact the attitudes and practices of health professionals against smoking. As a first step, official policies or regulations on tobacco use restrictions at health facilities should be created.

The implications of these findings suggest four ways to reduce cigarette smoking among Vietnamese health professionals. First, health professionals, as they are role models for their patients, should not smoke. According to Han and Rosenblood, when physicians are smokers, their advice is less credible for their patients.[14] Mausner further stated that those health-care providers who attempt to advise patients to quit smoking while their ashtrays contain cigarette butts are not convincing.[22] Second, health professionals should elicit feedback from patients regarding their own tobacco use as this feedback has a positive influence on the smoking behaviour of health professionals. Han and Rosenblood stated that obtaining feedback from patients can be useful in enhancing the beliefs and attitudes of physicians against tobacco smoking.[14] Third, strictly implemented policies and regulations on tobacco restriction should be enacted at health facilities. Lastly, health professionals should be offered training on cessation and anti-tobacco methods since most of them are in need of and open to training.

Some limitations are inherent in this study. Since medical training

curricula are heavy, the survey was accessed by students only when they had a 15-minute break. Some did not complete all the items of the questionnaires, resulting in some missing data. Some have underestimated their tobacco smoking behaviour. Some information came from medical students' history, and, as a result, recall bias may be included. However, the aims of the study were explained to the students. Informed consent and confidentiality agreements were set out prior to the survey in an attempt to minimize the bias of the study.

For the survey on tobacco use among health-care providers, due to the nature of self-report study design, some errors are inevitable. These errors include recall and non-response bias and reporting errors as stated by Hilton (in Patkar et al.).[36] It is likely that health professionals could have over- or underestimated their smoking status.

Both questionnaires to survey smoking among medical students and health professionals are based on the sample questionnaires of the Global Youth Tobacco Survey and the WHO Global Health Professional Survey. These questionnaires are standardized and, therefore, are believed to reduce bias and to provide valuable information on current tobacco use behaviour, knowledge, belief, attitude and practice among health-care providers in Vietnam.

It is clear that tobacco use is a global problem, and smoking among health professionals and medical students, in particular, is a cause for concern. With the lack of official and strict regulations or policies on tobacco advertisement and use, it is estimated that tobacco use among health professionals and medical students in Vietnam may not improve if no other efforts are made. Ministry of Health officials and policy-makers should work together to develop adequate policies for tobacco control at health facilities and medical universities to ensure that health professionals and medical students are able to act as non-smoking exemplars and to play a crucial role in reducing tobacco use among patients.

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About SEATCA

The Southeast Asia Tobacco Control Alliance (SEATCA) works
closely with key partners in ASEAN member countries to
generate local evidence through research programs, to enhance
local capacity through advocacy fellowship program, and to be
catalyst in policy development through regional forums and in-country
networking. By adopting a regional policy advocacy mission, it has supported
member countries to ratify and implement the WHO Framework Convention
on Tobacco Control (FCTC)

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