

Behaviors and Attitudes Toward Smoking Among Health Care Workers at Health Facilities in 4 Provinces of Vietnam: A Representative Cross-Sectional Survey

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Abstract

Tobacco smoking is a leading cause of premature death. Smoking prevalence in Vietnam ranks among the highest in Southeast Asia. Given the important role of health care workers (HCWs) in promoting and supporting smoking cessation, this project aimed to characterize the prevalence of smoking among HCWs in Vietnam, and their attitudes toward smoking cessation interventions. A cross-sectional survey was conducted among care workers in 4 levels of the health system, within 4 provinces of Vietnam. Descriptive statistics evaluated participant attitudes, perception, behaviors, and knowledge about smoking. Multivariable logistic regression models evaluated risk factors for smoking. Among 3343 HCWs, 7.5% identified as current smokers, comprising 22.2% males and 0.5% of females. Males had substantially greater odds (adjusted odds ratio = 55.3; 95% confidence interval = 29.0-105.6) of identifying as current smokers compared with females. HCWs in urban settings had higher odds of identifying as smokers compared with rural workers (adjusted odds ratio = 1.72; 95% confidence interval = 1.23-2.24). Strong support for smoking cessation policies and interventions were identified, even among staff who smoked. HCWs play an integral role in identifying smokers and supporting smoking cessation interventions for their patients. Efforts to support affordable smoking cessation interventions within health facilities are likely to contribute to a reduction in smoking prevalence in Vietnam.

Keywords

smoking, smoking prevention, health facilities, tobacco products, health personnel

What We Already Know

- Smoking cessation among health care workers has been an important precursor for broader efforts to reduce smoking rates among the general population in many settings.
- Health care workers play an important role in supporting smokers to quit, although they often lack sufficient training.

What This Article Adds

- Smoking is less common among health care workers than the general population; however, a substantial

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proportion of male doctors continue to smoke in Vietnam.

- Support for smoking cessation policies is strong among health care workers in Vietnam, even those who smoke. This indicates support for more ambitious efforts to combat smoking within Vietnamese health care facilities.

Introduction

Smoking tobacco remains a leading cause of premature death worldwide, with approximately 6 million premature deaths attributed to tobacco smoking annually.^{1,2} Most of the 1 billion people who smoke reside in low- and middle-income countries.^{3,4} Smoking is a well-known risk factor for adverse health outcomes including, but not limited to, chronic obstructive pulmonary disease, asthma, and numerous malignancies.^{5,6}

The prevalence of smoking in Vietnam ranks among the highest in Southeast Asia, with 45.3% of the male population identifying as smokers.⁷ The Vietnamese government has taken a number of steps to mitigate the harmful effects of tobacco and decrease the prevalence of smoking. Vietnam is a signatory to the World Health Organization's Framework Convention on Tobacco Control, a global public health treaty that aims to prevent future harm from tobacco.⁸ The government has also established laws and decrees that aim to control tobacco consumption and decrease smoking in public places including health care facilities. Despite these efforts, smoking rates remain high.⁷

A key opportunity for smoking cessation is when patients attend health facilities. Health care workers (HCWs) have a key role in supporting smoking cessation efforts among their patients.^{9,10} Smokers are more likely to quit when counselled and offered smoking cessation mechanisms by their health provider.^{11,12} Patients are also more likely to be satisfied with the care that they receive when health care providers assess their smoking status and provide smoking cessation counselling.¹³

Unfortunately, a considerable proportion of HCWs in Vietnam continue to smoke, impeding their capacity to promote smoking cessation and encourage patients to quit.¹⁴ Furthermore, the attitudes of HCWs toward smoking cessation interventions remains poorly understood. Vietnam has made a national commitment to tobacco control, implementing the Framework Convention on Tobacco Control in 2005 and introducing national policies to restrict tobacco.¹⁵ Attempts to reduce smoking rates within hospitals requires a better understanding of the drivers of HCW smoking behaviors, and how they view smoking cessation interventions. Therefore, this study aimed (1) to characterize the smoking behaviors of HCWs in 4 levels of the Vietnamese health care system and (2) to characterize their attitudes toward smoking cessation, and how this was moderated by their own smoking habits.

Methods

Study Sites

A cross-sectional survey was conducted within 56 public health care facilities at all 4 levels of the health system, including 2 national, 6 provincial, 16 district, and 32 commune level health facilities. The study was conducted in 4 provinces of Vietnam—2 southern provinces (Ho Chi Minh City and Cà Mau) and 2 northern provinces (Hà Nội and Thanh Hóa), including the country's 2 most populous cities. In addition to 2 lung hospitals in the capital Hanoi, and 6 provincial lung hospitals, 16 district-level health care facilities were selected by simple random sampling among all such clinics in each province. No selected facilities declined to participate. The probability of selecting the district-level facilities was in proportion to the population of the district. Within each selected district, we randomly selected 2 commune health facilities, with a total of 32 commune facilities, with the probability of selection in proportion to their population. Health care facilities were classified as urban or rural, in accordance with government definitions.

Directors of selected facilities provided approval to participate. If participation was declined, then another facility was randomly selected from the same province or district.

Study Participants

Health care workers were people employed to work in a health care facility in any role. This included, but was not limited to, doctors, nurses, laboratory staff, radiology staff, students, administrative staff, and trainees. For facilities with a staff of 200 people or fewer, all HCWs were invited to participate. For larger health facilities, where more than 200 staff members were employed, we randomly selected departments to participate until the total sample exceeded 200 people.

Current full-time or part-time employees in participating health care facilities were eligible to participate. Subjects were excluded if they were not working on the day that the study was conducted. Surveys were conducted during meetings at the health facility.

The roles of the HCWs were categorized as follows: nurses, doctors, orderlies, administrative officers, doctor's aides, midwives, pharmacists, technicians, and other. The age of participants was stratified into 5 age groups: 18 to 29 years, 30 to 39 years, 40 to 49 years, 50 to 59 years, and ≥ 60 years.

Study Design and Data Collection

A letter of invitation was given to HCWs by leaders in each facility, requesting to complete the self-administered survey. The survey assessed participant demographics, smoking history, attitudes toward smoking restrictions, knowledge about methods of smoking cessation (derived from the Global Adult Tobacco Survey), and other issues relevant to smoke

exposure.¹⁶ Current smoking was based on self-report, including either daily or less than daily smoking. HCWs were also asked about their attitudes toward hospital-based interventions to reduce smoking among patients. Data were collected using paper forms and entered into an online database. The Fagerstrom Test for nicotine dependence was also completed.¹⁷

Data Analysis

Data were reviewed for completeness, then analyzed using IBM SPSS Statistics for Mac Version 25.0 (IBM Corp). Descriptive statistics were used to generate baseline demographic characteristics of the HCWs. Characteristics of smokers and nonsmokers were compared. Descriptive statistical analyses were also conducted to characterize attitudes, perception, behaviors, and knowledge on smoking. Univariate and multivariable logistic regression models were used to identify independent risk factors associated with current smoking. Covariates for the multivariate model were selected using reverse covariate selection, sequentially removing variables with a *P* value of $<.2$ from the multivariable model. Multivariable logistic regression was also used to compare the relationship between smoking status and participant attitudes, perception, behaviors, and knowledge. Odds ratios were presented with 95% confidence limits, and a *P* value of $\leq .05$ was considered significant.

Ethical Issues

This study was approved by the Human Research Ethics Committee at the University of Sydney (2017-511) and the Scientific Committee and Ethics Committee of Bach Mai Hospital (1106/CV-BM). Participant consent was demonstrated by completion of the study questionnaire.

Results

In total, 3343 of 3565 eligible HCWs approached completed the survey, resulting in a 93.8% response rate. The baseline characteristics of the participants are described in Table 1. The mean age of participants was 35.0 (standard deviation 9 years), with the largest proportion (41.3%) of participants aged between 30 and 39 years. HCWs aged ≥ 60 years comprised the lowest percentage (0.3%) of participants. Most HCWs were female, and nurses comprised the largest group of HCWs (47.1%) followed by doctors (18.7%). Approximately 66% of HCWs stated that they were involved in direct patient care.

Most participants were enrolled at district health facilities (58.1%), and the majority (58.3%) worked in facilities located in rural areas. Approximately 30% of participants worked in facilities located in the urban province of Ho Chi Minh City, followed by Hà Nội City (25.8%), Thanh Hóa Province (23.5%), and Cà Mau Province (21.0%).

A total of 250 (7.5%) HCWs reported as current smokers. Table 1 compares the baseline demographic characteristics of smokers and nonsmokers. The mean age of smokers was higher than nonsmokers, with smokers being on average 4.3 years older. The largest proportion of smokers were between the ages of 30 and 39 years.

The majority of smokers were male (95.5%), while the majority of nonsmoking HCWs were females (72.7%). Table 2 shows the proportion of HCWs who reported currently smoking, categorized by occupation. The highest smoking prevalence was among doctors, followed by technicians and administrators. The median Fagerstrom Score was 2 (interquartile range = 1-5), with only 23 (12%) current smokers demonstrating high or very high dependence.

The proportions of smokers by gender, location, and clinical role are shown in Supplementary Table S1 (available online). Factors associated with smoking among HCWs are shown in Table 3. Males had greater odds (odds ratio = 55.3, 95% confidence interval = 29.0-105.6) of identifying as current smokers when compared with females. The odds of identifying as a current smoker were higher for older individuals. HCWs working in an urban setting had lower odds of identifying as smokers compared with rural workers (odds ratio = 1.72, 95% confidence interval = 1.23-2.24). Involvement in direct patient care, study site, and province of facility were not associated with smoking.

Among 250 current smokers, 120 (48.0%) reported smoking daily. A majority of smokers (188; 75.2%) reported smoking fewer than 10 cigarettes a day. Among 243 smokers who had been smoking for at least a year, 176 (72%) had attempted to stop smoking within the past 12 months. However, Supplementary Table S2 (available online) shows the methods that smokers had used to attempt to quit over the past 12 months. When smokers were asked about their use of methods to quit in the preceding year, 130 (52%) smokers did not report using any method to assist with smoking cessation. Among staff who were smokers, 131 (55.3%) expressed some interest in quitting smoking, 27 (11.4%) planned to quit within the next month, and 112 (44.8%) reported thinking about quitting within the next 12 months.

Supplementary Table S3 (available online) shows the knowledge and attitudes of HCWs, by smoking status. The vast majority of smokers (94.2%) and nonsmokers (97.3%) agreed that smoking is dangerous to one's health. Most HCWs recognized that their smoking behaviors influenced others (96.5%). A high proportion believed that quit smoking programs should be offered free to employees (93.8%), a hospital should be a smoke-free environment (97.5%).

Among staff surveyed, 96% reported awareness that their facility had a smoke-free hospital policy. Supplementary Table S4 (available online) shows staff views regarding air quality at work due to cigarette smoke. Almost all staff (3166 of 3248, 97%) believed that the hospital should be smoke free. Almost all staff supported quit programs for staff, and agreed that visitors should be asked by staff to put out their

Table 1. Characteristics of 3343 Health Care Workers Surveyed Within Vietnamese Health Facilities.

	Total, N (% ^a)	Smokers, n (% ^a)	Nonsmokers, n (% ^a)
Total participants	3343	250 ^{b,c}	3078
Age in years, mean (SD)	35.0 (9.0)	39.0 (9.4)	34.7 (8.8)
Age group (years) ^d			
18-29	1040 (31.9%)	40 (16.3%)	996 (33.2%)
30-39	1347 (41.3%)	95 (38.8%)	1248 (41.6%)
40-49	542 (16.6%)	68 (27.8%)	474 (15.8%)
50-59	321 (9.8%)	40 (16.3%)	277 (9.2%)
≥60	9 (0.3%)	2 (0.8%)	7 (0.2%)
Gender ^e			
Female	2170 (67.4%)	11 (4.5%)	2159 (72.7%)
Male	1049 (32.6%)	233 (95.5%)	811 (27.3%)
Current role in health facility ^f			
Nurse	1574 (47.1%)	84 (33.6%)	1484 (67.6%)
Doctor	625 (18.7%)	83 (33.2%)	540 (18.0%)
Orderly	137 (4.1%)	8 (3.2%)	129 (4.3%)
Administrative officer	371 (11.1%)	35 (14.0%)	335 (11.2%)
Doctor's aid	72 (2.2%)	4 (1.6%)	68 (2.3%)
Midwives	40 (1.2%)	0 (0%)	40 (1.3%)
Pharmacist	120 (3.6%)	4 (1.6%)	116 (3.9%)
Technician	212 (6.3%)	25 (10.0%)	186 (6.2%)
Other	99 (3.0%)	4 (1.6%)	95 (3.2%)
Direct patient care ^g			
No	1123 (34.3%)	88 (35.6%)	1031 (34.2%)
Yes	2148 (65.7%)	159 (64.4%)	1986 (65.8%)
Site			
Commune health post	203 (6.1%)	12 (4.8%)	191 (6.2%)
District hospital	1942 (58.1%)	132 (52.8%)	1800 (58.5%)
Provincial hospital	846 (25.3%)	73 (29.2%)	769 (25.0%)
Central hospital	352 (10.5%)	33 (13.2%)	318 (10.3%)
Study site category			
Urban	1393 (41.7%)	132 (52.8%)	1252 (40.7%)
Rural	1950 (58.3%)	118 (47.2%)	1826 (59.3%)
Province			
Northern Vietnam			
Hà Nội	864 (25.8%)	60 (24.0%)	799 (26.0%)
Thanh Hóa	787 (23.5%)	76 (30.4%)	707 (23.0%)
Southern Vietnam			
Ho Chi Minh City	991 (29.6%)	56 (22.4%)	932 (30.3%)
Cà Mau	701 (21.0%)	58 (23.2%)	640 (20.8%)

Abbreviation: SD, standard deviation.

^aColumn % are presented.

^bThe proportion of smokers is 7.4%.

^cThere were 15 missing responses in the current smoker category.

^dThere were 84, 76, and 5 missing responses from the total, nonsmokers, and smokers groups, respectively, in the age category.

^eThere were 124, 108, and 6 missing responses from the total, nonsmokers, and smokers groups, respectively, in the gender category.

^fThere were 93, 85, and 3 missing responses from the total, nonsmokers, and smokers groups, respectively, in the current role in health care facility category.

^gThere were 72, 61, and 3 missing responses from the total, nonsmokers, and smokers groups, respectively, in direct patient care category.

cigarettes when visiting the facility (Supplementary Table S5, available online). Staff reported that a smoking ban would improve job performance, increase workplace morale, and improve the public image of the hospital (Supplementary Table S6, available online). Three quarters of staff believed that a smoking ban would greatly improve their health (2471 of 3200 staff, 77.2%).

Supplementary Table S7 (available online) shows the self-reported practices of 2126 doctors and nurses regarding smoking cessation practices. Most stated that they routinely provided advice about smoking cessation to patients, and that they were confident providing this advice (1969 of 2118, 93%). Most of the 2030 clinical staff (95.8%) indicated that doctors should routinely advise patients about how to stop

Table 2. Proportion of Smokers by the Role of Health Care Worker^a.

	Total participants (smokers and nonsmokers), N	Current smokers, n (%)	Current smokers, planning to quit in the next year, n (%)	Fagerstrom score, median score (interquartile range)	Number of smokers with high or very high dependence ^b
Overall	3240	250 (7.8%)	112 (44.8%)	2 (1-5) ^c	23 (12.0%)
Medical doctor ^d	623	83 (13.3%)	38 (45.8%)	3 (1-5)	12 (19.7%)
Technician ^e	211	25 (11.8%)	12 (48.0%)	2 (1-4)	0 (0%)
Administrative officer ^f	370	35 (9.5%)	14 (40%)	2 (1-4)	3 (10.7%)
Orderly	137	8 (5.8%)	3 (37.5%)	2 (2-2)	0 (0%)
Doctors' aid	72	4 (5.6%)	4 (100%)	2 (1-5)	0 (0%)
Nurses ^g	1568	84 (5.4%)	36 (42.9%)	2 (1-4)	8 (11.8%)
Pharmacist	120	4 (3.3%)	2 (50%)	1 (0-1)	0 (0%)
Midwife	40	0 (0.0%)	NA	NA	NA
Other	99	4 (4.0%)	1 (25.0%)	3 (0-5)	0 (0%)

Abbreviation: NA, not applicable.

^aRow % are presented.

^bA score of 6 to 10 out of 10 on the Fagerstrom test for nicotine dependence.

^cOne hundred ninety-two responses available for Fagerstrom score, which is out of a maximum of 10 points.¹⁷

^dTwo missing responses.

^eOne missing response.

^fSix missing responses.

Table 3. Bivariate and Multivariable Logistic Regression Model Assessing Factors Associated With Smoking in Health Care Workers^a.

	Unadjusted model		P	Adjusted model		P
	Odds ratio	95% CI		Odds ratio	95% CI	
Age (continuous)	1.05	1.04-1.06	<.001	1.03	1.02-1.05	<.001
Sex						
Female	Ref			Ref		
Male	56.4	30.63-103.79	<.001	55.3	29.0-105.6	<.001
Location						
Rural	Ref			Ref		
Urban	1.63	1.26-2.11	<.001	1.72	1.23-2.24	.002
Role in health care facility						
Other ^b (ref)	Ref			Ref		
Admin	2.13	1.21-3.76	.009	1.63	0.81-3.27	.171
Doctor	3.13	1.89-3.76	<.001	1.16	0.62-2.16	.646
Midwifery/nurse	1.12	0.68-1.85	.646	1.38	0.74-2.57	.313
Technician	2.74	1.48-5.06	.001	3.02	1.41-6.47	.004
Involved in direct patient care						
No	Ref			Ref		
Yes	0.94	0.72-1.23	.643	1.18	0.79-1.78	.391
Facility/study site						
Commune post	Ref			Ref		
District hospital	1.18	0.63-2.14	.619	1.24	0.61-2.53	.547
National hospital	1.65	0.83-3.27	.151	2.28	0.99-5.27	.053
Provincial hospital	1.51	0.80-2.84	.2	1.46	0.69-3.08	.415

Abbreviations: CI, confidence interval; Ref, reference variable.

^aBold text indicates $P < .05$.

^bOther include pharmacist, doctor's aides, and orderly.

smoking, and (95.1%) indicated that nurses should routinely advise patients. However, 82% of HCWs (1741 of 2119) indicated that a lack of time was a barrier to their providing smoking cessation advice.

Discussion

This cross-sectional survey of 3343 HCWs across Vietnam found that 22% of males and 0.5% of females reported as

current smokers and smoking was more common in urban settings. We found that most HCWs routinely asked their patients about smoking, and that a substantial majority of HCWs supported the strengthening of interventions to reduce smoking rates among patients. Policies for “smoke-free hospitals” were also strongly supported.

The prevalence of smoking among HCWs in Vietnam is considerably less than the general population, where 45.3% of males and 1.1% of females are current smokers.⁷ Our finding is comparable with data from other low- and middle-income countries.¹⁸ In 2010, a study in 9 hospitals selected purposively from Northern, Central and Southern Vietnam found 20.1% of men were current smokers, a similar finding to our study.¹⁴ In contrast, a study in 3 regional hospitals in 2008 found a much higher prevalence of male smoking (35.6% among males).⁹ Our study did not identify substantial regional variation in smoking, with our representative sample showing similar prevalence in the north and south of the country. These results contrast with the previous study, which found higher smoking rates in the northern region.⁹ These contrasting findings may reflect regional differences between hospitals and indicate the importance of selecting a nationally representative sample of hospitals. Nevertheless, smoking prevalence among male HCWs remains high, despite a decade of policy reform and “smoke-free hospital” policies.⁸ The smoking behavior of these HCWs is likely to reduce their motivation to offer smoking cessation interventions to their patients.

The vast majority of our participants who reported being current smokers were male, consistent with previous findings.^{9,14} These results demonstrate that the significant difference in smoking habits between genders in the general Vietnamese population is also reflected in the health workforce. A key contributing factor to explain this difference is a long-standing social norm that links gender roles with smoking in this setting.^{19,20} In contrast, female smoking has long been considered socially unacceptable in Vietnam. Therefore, efforts to change smoking behavior must also address cultural and societal norms relating to gender and smoking. Nevertheless, the substantially lower smoking prevalence in male HCWs compared with the general population demonstrates a shift in social norms in this occupational setting.

An encouraging finding was that smoking prevalence was lower among younger age groups. This is consistent with the national prevalence data,⁷ and suggests that the next generation of health workers will increasingly model appropriate behavior to their patients. This trend will help strengthen an emerging social norm that HCWs are smoke free. The finding that smoking prevalence remains high among older male doctors is worrisome, given the moral authority possessed by doctors in guiding patient decisions. Interventions to reduce smoking rates among HCWs will be critical to efforts to scale up smoking cessation counselling by HCWs in routine practice.

Promisingly, our study found that 72% of our smoking HCWs had attempted to quit in the past 12 months. With >90% of our participants agreeing that free smoking cessation programs should be available, this study provides evidence for the openness of HCWs to support evidence-based tobacco control measures,²¹ if staff are adequately supported. We also showed that a minority of HCWs who are smokers have a high level of nicotine dependence, and most are motivated to quit. Implementation of a smoke-free hospital is also widely supported, with perceived benefits to the quality of the work environment and health of the community. This indicates the enormous potential for well-designed smoking cessation programs to obtain strong staff support. However, at the same time, we found that many HCWs in our study perceived that they lack the skills to perform counselling adequately. Time pressure also limited their capacity to deliver counselling. Therefore, further efforts are warranted to train staff in smoking cessation techniques and increase the time available to consult with each smoker. Smoking cessation needs to be embedded in the health care system, through a comprehensive and systematic approach that is action oriented.

This study has several limitations. First, the survey relied on HCW self-report to assess smoking status. Given the potential for social desirability bias among HCWs who realize the harmful effects of smoking, misclassification of smoking status cannot be excluded. Second, as we did not observe the smoking behaviors of HCW, it is possible that HCWs’ smoking statuses differ from that reported in the survey. For this reason, we are unable to explore the relationship between the actual smoking status of doctors and their self-reported behaviors relating to smoking cessation advice.

Strengths of this study include the large number of health facilities surveyed, an evaluation of all 4 levels of the Vietnamese health care system throughout 4 provinces in the northern and southern regions. Consequently, study findings are likely generalizable to a range of rural and urban health facilities. Furthermore, we achieved a high participation rate (93.8%) among eligible HCWs, reducing the likelihood of selection bias.

This study has several important policy implications. First, the study demonstrates the importance of including HCWs in smoking cessation interventions. In this study, HCWs recognized the importance of their smoking practices on their capacity to counsel patients who smoke. An overwhelming majority recognized the benefits to their health and others due to smoking. However, around 1 in 5 male HCWs still smoke. Furthermore, less than a half had attempted to quit over the past year. While formal cessation programs for HCWs in Vietnam are lacking in many health facilities, this study found that over 90% of staff believed quit programs should be offered free to employees. Hence, HCWs will be highly receptive to comprehensive smoking cessation support, such as free nicotine replacement, staff counselling, and smoking quit lines.^{21,22} Second, this study

demonstrates the strong receptiveness of staff to smoking bans within health care facilities—even among smokers. Just 20% of workers felt that a ban would be unfair to smokers, and 78% felt a smoking ban would improve their job performance. These data provide health care leaders with the evidence they need to advocate strongly for smoking bans and other restrictions on tobacco in Vietnamese hospitals.

Conclusion

In conclusion, HCWs should be an integral part of tobacco smoking screening and smoking cessation advocacy. Interventions to increase the availability of smoking cessation services for HCWs will contribute to reducing smoking among patients.²¹ Capacity-building interventions to augment the counselling skills of HCWs and provide access to evidence-based methods of smoking cessation (such as pharmacotherapy and brief counselling)^{11,23,24} promise to reduce smoking rates among patients presenting to health facilities. A system-wide approach is critical if smoking rates are to reduce among patients and HCWs. Given the substantial physical harm that smoking causes, this study shows that further actions to scale-up effective tobacco control practices within health care facilities in Vietnam are urgently needed.

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Declaration of Conflicting Interests

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Supplemental Material

Supplemental material for this article is available online.

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