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Chinese Physicians and Their Smoking Knowledge, Attitudes, and Practices

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Abstract

Background—China has the most smokers in the world. Physicians play a key role in smoking cessation but little is known about Chinese physicians and smoking.

Methods—This 2004 clustered randomized survey of 3552 hospital-based physicians from six Chinese cities measured smoking attitudes, knowledge, personal behavior, and cessation practices for patients. Descriptive statistics and multivariate analysis of factors associated with asking about or advising against smoking were conducted in 2005 and 2006.

Results—Smoking prevalence was 23% among all Chinese physicians, 41% for men and 1% for women. Only 30% report good implementation of smoke-free workplace policies and 37% of current smokers have smoked in front of their patients. Although 64% usually advise smokers to quit, only 48% usually ask about smoking status and 29% believe most smokers will follow their cessation advice. Less than 7% set quit dates or use pharmacotherapy when helping smokers quit. Although 95% and 89% respectively know active or passive smoking causes lung cancer, only 66% and 53% respectively know active or passive smoking causes heart disease. Physicians were significantly more likely to ask about or advise against smoking if they believed that counseling about health harms help smokers quit and that most smokers would follow smoking cessation advice.

Conclusions—Physician smoking cessation, smoke-free workplaces, and education on smoking cessation techniques need to be increased among Chinese physicians. Strengthening counseling skills may result in more Chinese physicians helping smoking patients to quit. These improvements can help reduce the Chinese and worldwide health burden from smoking.

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INTRODUCTION

China consumes more cigarettes than any other country in the world and is home to 350 million current smokers.¹ China has a smoking prevalence of 31%; 57% of men and 3% of women smoke.¹ Additionally, 52% of nonsmokers in China are exposed to secondhand smoke either at home or at work.¹ Smoking in China has tremendous health consequences, with 514,000 premature deaths due to smoking-related illnesses in 1998,² and is responsible for over 7% of all deaths.³ These mortality numbers are underestimates as they do not account for secondhand smoke-related deaths.

Physicians can play a key role in smoking cessation.^{4–6} Simple interventions, such as advising a smoker to quit, and more intensive interventions, such as counseling or pharmacologic therapy, increase the odds of a smoker quitting.^{4,5} Physicians can also serve as role models for healthy behaviors by not smoking. Smoke-free hospitals are important for the health of patients and health care workers, and can help with smoking cessation.⁷

Little is known about Chinese physician smoking behavior and their smoking cessation attitudes and practices.⁸ One study of 500 physicians in the city of Wuhan showed a smoking prevalence of 61% for men and 12% for women.⁹ This study also found that 58% of physicians usually advise smokers to quit, and that 85% thought that physicians should be non-smoking examples and should help smokers quit.⁹ A second study of 361 physicians working in a rural teaching hospital in Hebei province demonstrated a smoking prevalence of 31.9% for males only and that among all physicians, those aged 50–54 years (31.6%) had the highest smoking prevalence.¹⁰

This is a report on the first geographically diverse survey of physicians from six different urban cities throughout China regarding physician smoking behavior and their smoking knowledge, attitudes, and practices.

POPULATION AND METHODS

Population

The survey was conducted between July 2004 and October 2004 on physicians from six cities: Chengdu, Guangzhou, Harbin, Lanzhou, Tianjin, and Wuhan (Figure 1). These cities were selected as they were representative of different regions throughout China. In each city, hospitals were stratified by catchment size into provincial, city, and district-level hospitals. Non-hospital based physicians were included by considering two community health centers as the equivalent to one district-level hospital. In each stratification category, five hospitals were randomly selected for survey inclusion. Within each hospital, at least two departments were randomly selected for survey inclusion. All physicians from selected departments were contacted by telephone and asked to participate in the survey. In order to ensure that the survey sample was comprised of at least 35% men, an additional department was randomly drawn for survey inclusion if the initial departments consisted of less than 35% men. The initial power calculation determined a necessary sample size estimate of 450 physicians at each city, based on an expected 25% smoking prevalence and a SD of 4% from previous unpublished data on physicians¹¹ and 95% confidence intervals. The sample sizes were increased to 600 physicians at each city to account for non-responders and missing data. The overall refusal rate for all sites was 6.2%. A total of 3652 physicians completed the survey.

Design and Procedures

The survey was a modified form of the Global Health Professional Survey,¹² and was conducted in Chinese. The survey and study were approved by the institutional review boards of the Chinese Center for Disease Control and Prevention and the University of California,

Berkeley. Consenting physicians were surveyed with a combined in-person interview and self-administered questionnaire. The in-person interview asked questions about smoking cessation practices and personal smoking behavior, and was followed by the self-administered questionnaire that asked questions about smoking knowledge, smoking cessation beliefs, and personal characteristics. Consenting physicians were given an option to complete the entire survey via self-administered questionnaire, but none chose this option. Interviews were conducted by Chinese Center for Disease Control and Prevention staff. A quality control team in each city examined 10% of the questionnaires every day to ensure consistency across interviewers and between different days.

Respondents were classified as current, former, or never smokers according to World Health Organization classifications.¹³ Current smokers were defined as those individuals who had smoked at least 6 months during their lifetime and were smoking tobacco products at the time of the survey. Former smokers were defined as those individuals who had smoked at least 6 months during their lifetime but no longer currently smoke. Never smokers were defined as those individuals who had never smoked or had smoked less than 6 months during their lifetime. Heavy daily smokers were defined as current daily smokers who smoked on average at least one pack a day.

Statistical Analyses

All statistical analyses were performed using SAS version 9.1 (SAS Institute, Inc.; Cary, NC; 2003) in 2005 and 2006. Chi-square tests and 95% confidence intervals were calculated using PROC SURVEYFREQ and PROC SURVEYMEANS with stratification at the city level and clustering at the hospital level. The two-tailed significance level was set at 5% ($p < 0.05$). Instances of missing data were dealt with by logical imputation. Logical imputations could not be performed for 100 individuals with missing data in the analyzed variables, and further complex imputations were not performed *a priori* for the small proportion of individuals (<3% sample); these individuals were eliminated from the final analysis, leaving 3552 physicians in the final sample.

Bivariate and multivariate analyses were conducted for two outcomes: if physicians usually ask about smoking status and usually advise smokers to quit. Variables were selected *a priori* for analysis based on hypothesized relationships with smoking cessation activity, and included sociodemographic variables, smoking status, medical training, beliefs regarding smoking cessation, and knowledge of health harms. Analyses were performed using SAS 9.1 for Windows (Cary, NC) (PROC SURVEYLOGISTIC) with stratification at the city level and clustering at the hospital level. Multivariate models were constructed using forward stepwise automated methods and manual entry of variables statistically associated with our outcomes in bivariate analyses. Variables were retained based on their statistical association with the outcome of interest or to retain face validity. The multivariate analysis presented here focuses on two key variables: (1) knowledge about the relationship between ischemic heart disease and active smoking, and (2) knowledge about the relationship between ischemic heart disease and passive smoking. This study focuses on ischemic heart disease knowledge as it appears to represent more sophisticated knowledge of smoking harms; univariate analyses showed relatively few physicians were aware of its relationship to smoking despite being a common cause of death in China.³ Other predictor variables in this multivariate analysis included age, gender, smoking status, specialty, all belief questions on smoking cessation (should physicians offer to help smokers quit, does counseling on smoking health harms help with smoking cessation, does counseling on secondhand smoke health harms help with smoking cessation). Odds ratios were calculated with 95% confidence intervals, and two-tailed $p < 0.05$ was considered statistically significant in all analyses.

RESULTS

Table 1 describes the physician sample. In the sample, over half were male and subjects were evenly distributed throughout the cities. Over 60% of all surveyed physicians were under the age of 40, while less than 3% were over the age of 60 (state mandated retirement age). Most physicians were in internal medicine, surgical, or gynecologic specialties.

Smoking Prevalence

Table 2 shows that 22.9% (95% CI 19.3% to 26.6%) of surveyed physicians were current smokers and most smoked less than a pack of cigarettes a day. There were few former smokers (2.7%), although prevalence increased generally with age. Current and heavy daily smoking prevalence increased with age except in physicians over the age of 60. Male physicians had a much higher smoking prevalence than female physicians (40.7% vs. 1.0%; Table 2).

Physician Smoking Behavior Attitudes and Practices

Table 3 shows most physicians believed that physicians should be non-smoking role models and that hospitals should be completely smoke-free. Current smokers were significantly more likely to disagree with these attitudes than never smokers. More than one-third of current smokers had smoked in front of their patients and nearly all had smoked during their work shift. Less than a third of physicians reported effective implementation at their hospital, and current smokers were significantly less likely to report such implementation than never smokers.

Physician Attitudes and Practices Towards Patients Who Smoke

Table 4 shows only two-thirds of all physicians believed they should offer to help smokers quit and there was no significant difference between current and never smokers. Less than one-third believed smokers would follow their cessation advice. While nearly two-thirds of all physicians believed counseling about the harms of smoking help with smoking cessation, only half believed counseling about family member health harms from secondhand smoke would help. Never smokers were significantly more likely than current smokers to hold these three beliefs.

Less than half of all physicians usually asked their patients if they smoke (Table 4). However, two-thirds of all physicians reported they usually advise smokers to quit. Less than half usually provided positive encouragement when advising smokers to quit. Few set quit dates or used pharmacotherapy (i.e., nicotine replacement therapy or bupropion) when helping smokers to quit.

Chinese herb and acupuncture was used more frequently than pharmacotherapy but overall use was still low (16%). Never smokers were more likely than current smokers to ask about smoking status, advise smokers to quit, provide positive encouragement, set quit dates, or use Chinese herbs or acupuncture to assist with quitting.

Physician Smoking Knowledge

Nearly all (95%) physicians believed active smoking causes lung cancer. Most physicians also believed that passive smoking causes lung cancer (89%), passive smoking causes asthma in adults (84%) and children (82%), and that active smoking causes chronic obstructive pulmonary disease (89%). Current smokers were significantly less likely ($p < 0.05$) to hold these smoking knowledge beliefs compared to never smokers.

In contrast, only two thirds (67%) of physicians believed that either active smoking causes ischemic heart disease. Even fewer (53%) believed that passive smoking causes ischemic heart

disease. Only one fifth (21%) of physicians believed that passive smoking causes sudden infant death syndrome. Current and never smokers did not differ significantly ($p < 0.05$) on these smoking knowledge beliefs.

Predictors of Asking About Smoking Status or Advising Smokers to Quit

Multivariate analyses show that physicians were more likely to ask about smoking status or advise smokers to quit if they held beliefs that most smokers will follow their smoking cessation advice, and that counseling on direct or passive smoking health harms usually helps with smoking cessation (Table 5). In addition, internal medicine physicians were more likely than surgeons and other specialists to advise smokers to quit.

Other significant predictors of asking about smoking status included being younger than 30 years of age, knowledge of the relationship between passive smoking and ischemic heart disease, and believing physicians should offer to help smokers quit. In addition, current smokers were significantly less likely than never smokers to advise smokers to quit.

DISCUSSION

This is the first geographically diverse survey of Chinese physician smoking behavior and their smoking cessation attitudes and practices. Male physician smoking prevalence is high with few former smokers, in contrast to the low female physician smoking prevalence. This pattern is reflective of China's general population, although overall physician rates are lower. Chinese physicians have a substantially higher smoking prevalence than U.S. (3.3%)¹⁴ or U.K. (6.8%)¹⁵ physicians, although these countries have lower general population smoking prevalences (U.S., 20.9%¹⁶; U.K., 25.0%¹⁷) than China. Japan's smoking prevalence rate (33.8%)¹⁸ is similar to China's. Chinese physicians have a slightly higher smoking prevalence than Japanese physicians (20.2%), but Japanese physicians have a smaller gender discrepancy than their Chinese counterparts (27% male and 7% female smoking prevalence).¹⁸ A recent survey of Hong Kong physicians found that only 4.3% smoke, although the response rate was low (19%).¹⁹ However, this low smoking prevalence rate is not surprising given the historically close ties between the Hong Kong and the U.K. medical training systems.²⁰ Male Chinese physician smoking prevalence is similar to U.S. and U.K. physicians prior to the first Surgeon General's report detailing the health consequences of smoking.^{21–23} In both the U.S. and U.K., where smoking prevalence has greatly declined in the general population, physicians took the lead in substantially reducing their cigarette consumption.^{22, 23} This decline underscores the need for targeted efforts aimed at Chinese physician smoking cessation, since physicians can act as a role model for healthy behavior and guide smokers through stages^{24, 25} of the smoking cessation process.

Reducing Chinese physician smoking prevalence is an important tobacco control measure as physicians who currently smoke are significantly less likely to advise smokers to quit. Such a reduction requires both uptake prevention and cessation among physicians. As physicians under the age of 30 have a lower smoking prevalence, smoke fewer cigarettes than their older colleagues, and ask patients about smoking status more frequently, there is hope that smoking prevalence may decline and smoking cessation practices may improve in the future. Maintenance of the low smoking rate among Chinese female physicians will be critical in reducing overall physician and general population smoking rates. Increased smoking behavior by Chinese female physicians could encourage similar behavior among Chinese women; a 1% increase in Chinese women smoking prevalence would result in over 6 million additional smokers. In addition, our findings suggest that physician never smokers are more likely than physician current smokers to advise patient smokers to quit. Chinese hospitals are already nominally smoke-free, but strengthening smoke-free hospital policy implementation could

help reduce smoking^{7, 26} while protecting the health of patients and nonsmoking health care workers from secondhand smoke.

Physician education is important, particularly on counseling smokers about active and passive smoking harms, as physicians who believe such counseling is effective are significantly more likely to ask about smoking status and to advise smokers to quit. Physicians also need more education on the ischemic heart disease risks of active and passive smoking, as heart disease is the leading cause of death in China.³ In addition, knowledge about ischemic heart disease risks from passive smoking is associated with an increased likelihood of a physician usually asking about smoking status. Furthermore, physician education about sudden infant death syndrome risks from passive smoking may be useful in a society that has a “one-child” policy. Current medical school curriculum has been shown to alter smoking behavior in young adults.²⁷ Incorporating and adapting smoking cessation best practices⁴ into the medical school curriculum may help educate and prevent new physician smokers. Such curricula are critical for surgeons and other non-internists, as their rates of asking and advising smokers to quit are much less than internists.

The high self-report rate of Chinese physicians advising smokers to quit is offset by lower responses of asking about smoking status and providing substantive assistance. In contrast, physicians in the U.S. ask about smoking status at two-thirds of all visits, but only advise about 20% (although they report higher rates).²⁸ Hong Kong physicians are more like U.S. physicians, as 77% report usually asking about smoking status and 29% report usually advising smokers to quit.¹⁹ The low rate of asking about smoking status suggests that many smokers are unidentified and thus cannot be advised to quit. Chinese physicians need more education about offering assistance to smoking patients. Standard smoking cessation practices, such as setting quit dates or using pharmacotherapy like NRT and bupropion,⁴ are rarely used. Even if these strategies were culturally inappropriate or unsuitable for the Chinese context (e.g., low availability of pharmacotherapy),²⁹ use of Chinese herbal preparations or acupuncture³⁰ for smoking cessation assistance is also low. Similarly, Hong Kong physicians rarely use pharmacotherapy (7%).¹⁹ Educating physicians about effective advising techniques is critical, particularly since physicians who believe their smokers will follow their smoking cessation advice are more likely to ask about smoking status and advise smokers to quit.

This study does not examine physicians in rural areas, where 60% of the population resides. Rural smoking rates are lower in part due to income differences^{31, 32} but may be underestimated due to unmeasured nondaily smoking behavior; improvements in the Chinese economy may increase rural smoking rates. This study relies on self-reported smoking behavior, which may underestimate smoking compared to cotinine measurements³³ and overestimate smoking cessation practices.²⁸ This study has few elderly smokers, in part because the mandatory retirement age is 60.

China is a key battleground in the fight against the global tobacco epidemic. Educating and engaging Chinese physicians is a necessary first step for reducing the burden of tobacco in China. This effort may be supported by China’s ratification the World Health Organization’s Framework Convention on Tobacco Control,³⁴ which recommends cigarette tax increases,^{35, 36} enforcement of smoke-free environments, advertising restrictions and countermarketing, and provision of cessation aids.^{5, 37, 38} As a result of this survey, the China Centers for Disease Control has begun a nationwide non-smoking campaign for physicians and medical students, and a smoke-free hospital campaign; however this is only a first needed step. Further interventions can target physician smokers, monitor smoke-free hospitals, and educate about effective smoking cessation practices. Experiences from countries where physician smoke less and more effectively carry out smoking cessation practices need to be shared with Chinese

physicians in order to improve Chinese physician smoking behavior and their smoking cessation practices.

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Figure 1.
Surveyed cities

Table 1

Characteristics of participants in the present study

	Physicians (%)	
	Men	Women
Number of physicians	55.1 [1958]	44.9 [1594]
Age, year		
<30	30.1 [590]	27.0 [431]
30–39	31.8 [622]	32.5 [518]
40–49	20.9 [409]	25.4 [405]
50–59	13.7 [269]	13.1 [208]
≥ 60	3.5 [68]	2.0 [32]
Regions		
Chengdu	15.9 [312]	17.2 [274]
Guangzhou	17.2 [336]	14.9 [238]
Haerbin	13.1 [256]	21.1 [336]
Lanzhou	19.6 [384]	14.2 [227]
Tianjin	18.2 [356]	15.1 [240]
Wuhan	16.0 [314]	17.5 [279]
Specialties		
Internal medicine	21.8 [437]	33.1 [542]
Surgery	41.0 [823]	7.7 [126]
Gynecology	1.6 [33]	19.5 [319]
Pediatrics	2.5 [50]	6.2 [101]
Orthodontics	4.8 [96]	7.3 [119]
Emergency medicine	3.0 [61]	2.0 [33]
Traditional Chinese		
Medicine	7.1 [143]	6.4 [105]
Other specialty	18.2 [315]	17.8 [249]

Actual numbers are in brackets.

Table 2

Chinese physician and Chinese general population smoking prevalence

	Physicians (%)	General population (%) ¹¹
Men (n = 1958)		
Current smokers	40.7 [797] (35.5 – 45.9)	63.0
Heavy smokers	7.0 [138] (5.4 – 8.7)	7.5
Former smokers	4.7 [93] (3.7 – 5.8)	3.9
Never smokers	54.6 [1068] (48.9 – 60.2)	33.1
Women (n = 1594)		
Current smokers	1.0 [16] (0.6 – 1.4)	3.8
Heavy smokers	0.2 [3] (<0.1 – 0.4)	0.2
Former smokers	0.3 [4] (<0.1 – 0.6)	0.4
Never smokers	98.7 [1574] (98.1 – 99.4)	95.8

95% confidence intervals are reported in parentheses. Actual numbers are reported in brackets.

Table 3

Chinese physicians' attitudes and practices regarding physician smoking

	All (% <i>n</i> = 3552)	Female (% <i>n</i> = 1594)	Male (% <i>n</i> = 1958)	Current smoker (% <i>n</i> = 813)	Former smoker (% <i>n</i> = 97)	Never smoker (% <i>n</i> = 2642)
Attitudes						
Physicians should set a non-smoking example ^{*,†}	86.4 [3070] (83.7–89.1)	90.8 [1447] (87.8–93.8)	82.9 [1623] (80.2–85.6)	75.2 [611] (72.2–78.1)	91.8 [89] (86.7–96.9)	89.7 [2370] (86.7–92.7)
Hospitals should be completely smoke-free ^{*,†}	86.3 [3067] (83.5–89.2)	91.5 [1458] (89.2–93.7)	82.2 [1609] (79.0–85.4)	72.3 [588] (68.3–76.4)	95.9 [93] (92.3–99.5)	90.3 [2386] (87.6–93.1)
Practices						
Have smoked in front of patients [*]	8.5 [303] (6.4–10.7)	0.3 [5] (0.1–0.5)	15.2 [298] (12.2–18.3)	36.9 [300] (32.1–41.7)	3.1 [3] (<0.1–0.7)	0
Have smoked during shift [*]	21.0 [746] (17.6–24.4)	0.6 [10] (0.2–1.0)	37.6 [736] (32.7–42.5)	90.5 [736] (88.9–92.1)	10.3 [10] (1.5–19.1)	0
Good implementation of smoke-free hospital [†]	29.7 [1054] (26.7–32.6)	31.6 [504] (28.3–34.9)	28.1 [550] (24.2–31.9)	25.8 [210] (20.9–30.8)	33.0 [32] (26.5–39.5)	30.7 [812] (27.8–33.6)

* Significant ($p < 0.05$) difference between male and female physicians.[†] Significant ($p < 0.05$) difference between all 3 subgroups, and between male current smokers and male never smokers. 95% confidence intervals are reported in parentheses. Actual numbers are reported in brackets.

Table 4

Physicians' attitudes and practices regarding patient smoking cessation

	All (% n = 3552)	Female (% n = 1594)	Male (% n = 1958)	Current smoker (% n = 813)	Former smoker (% n = 97)	Never smoker (% n = 2642)
Attitudes						
Physicians should offer to help smokers quit*	66.0 [2343] (61.5–70.4)	69.4 [1106] (64.2–74.5)	63.2 [1237] (58.4–68.0)	63.3 [515] (58.5–68.2)	66.0 [75] (53.5–78.4)	66.8 [1764] (61.8–71.7)
Most smokers will follow my smoking cessation advice**†	29.3 [1043] (26.7–32.0)	33.0 [526] (29.8–36.2)	26.4 [517] (23.7–29.1)	25.0 [203] (19.4–30.5)	22.7 [22] (12.3–33.1)	31.0 [818] (27.9–34.0)
Counseling on health harms from smoking usually helps with smoking cessation†	65.7 [2332] (61.7–69.6)	67.3 [1072] (61.9–72.6)	64.4 [1260] (60.7–68.0)	55.8 [454] (51.5–60.2)	66.0 [64] (54.5–77.4)	68.7 [1814] (64.3–73.0)
Counseling on health harms to family members by secondhand smoke usually helps with smoking cessation**†	53.6 [1904] (49.4–57.8)	58.2 [927] (52.7–63.6)	49.9 [977] (45.6–54.2)	41.1 [334] (35.6–46.5)	45.4 [44] (29.3–61.4)	57.8 [1526] (53.8–61.8)
Practices						
Usually asks patients if they smoke†	47.8 [1696] (41.2–54.3)	45.9 [732] (39.1–52.8)	49.2 [964] (42.4–56.1)	44.3 [360] (37.0–51.5)	43.3 [42] (32.9–53.7)	49.0 [1294] (42.3–55.6)
Usually advises smokers to quit†	64.4 [2286] (60.7–68.0)	66.5 [1060] (61.3–71.7)	62.6 [1226] (58.8–66.4)	53.1 [432] (47.5–58.7)	67.0 [65] (54.6–79.4)	67.7 [1789] (63.3–72.1)
Usually provides positive encouragement when advising smokers to quit**†	41.4 [1471] (37.9–44.9)	45.7 [729] (40.9–50.6)	37.9 [742] (34.3–41.5)	30.5 [248] (25.2–35.8)	47.4 [46] (31.9–62.9)	44.5 [1177] (41.1–48.0)
Usually sets a quit date when advising smokers to quit†	6.1 [215] (4.8–7.3)	6.2 [99] (4.8–7.6)	5.9 [116] (4.3–7.6)	4.6 [37] (2.9–6.2)	6.2 [6] (1.3–11.0)	6.5 [172] (5.2–7.8)
Have used Chinese herbs or acupuncture when helping smokers quit†	16.4 [584] (13.9–19.0)	16.3 [260] (13.6–19.0)	16.5 [324] (12.7–20.4)	12.5 [102] (9.1–16.0)	16.5 [16] (7.4–25.6)	17.6 [466] (15.2–20.0)
Have used nicotine replacement therapy when helping smokers quit	6.6 [236] (4.3–9.0)	6.5 [103] (4.1–8.8)	6.8 [133] (3.9–9.7)	5.9 [48] (2.7–9.1)	13.4 [13] (0.6–26.2)	6.6 [175] (4.3–8.9)
Have used bupropion when helping smokers quit	4.5 [161] (3.2–5.8)	3.8 [61] (2.4–5.2)	5.1 [100] (3.1–7.1)	4.9 [40] (2.6–7.2)	5.2 [5] (0.0–10.3)	4.4 [116] (3.1–5.7)

† Significant ($p < 0.05$) difference between all 3 subgroups, and between male current smokers and male never smokers. 95% confidence intervals are reported in parentheses. Actual numbers are reported in brackets.

* Significant ($p < 0.05$) difference between male and female physicians.

Table 5

Predictors of asking about smoking status and advising smokers to quit

Characteristic	Usually asks if a patient smokes		Usually advises smokers to quit	
	Bivariate	Multivariate	Bivariate	Multivariate
Attitudes (Always or usually compared to sometimes, usually not, or never)				
Physicians should offer to help smokers quit [*]	1.31 (1.12–1.53)	1.17 (1.01–1.35)	1.53 (1.24–1.89)	1.21 (0.92–.60)
Most smokers will follow my smoking cessation advice ^{*†}	2.25 (1.98–2.53)	1.58 (1.41–1.78)	3.85 (2.94–5.04)	2.05 (1.68–2.50)
Counseling on direct health harms from smoking usually helps with smoking cessation ^{*†}	6.46 (5.30–7.89)	4.35 (3.49–5.42)	19.36 (14.61–25.65)	9.89 (7.43–13.17)
Counseling on passive smoking health harms usually helps with smoking cessation ^{*†}	3.40 (2.75–4.20)	1.30 (1.04–1.64)	8.87 (6.84–11.51)	2.00 (1.59–2.51)
Knowledge (Definite relationship compared to possible or no relationship)				
Active smoking and ischemic heart disease	1.75 (1.49–2.07)	1.12 (0.92–1.35)	1.62 (1.40–1.89)	1.04 (0.96–1.13)
Passive smoking and ischemic heart disease [*]	1.84 (1.44–2.35)	1.36 (1.03–1.79)	1.58 (1.31–1.89)	1.06 (0.89–1.26)
Age (compared to less than 30)				
30–39 [*]	0.62 (0.51–0.74)	0.63 (0.53–0.74)	0.81 (0.67–0.97)	0.94 (0.81–1.09)
40–49 [*]	0.42 (0.36–0.50)	0.44 (0.37–0.53)	0.67 (0.56–0.81)	0.82 (0.63–1.06)
50–59 [*]	0.44 (0.37–0.53)	0.42 (0.35–0.51)	0.68 (0.54–0.85)	0.73 (0.52–1.01)
60+ [*]	0.43 (0.26–0.73)	0.41 (0.23–0.72)	0.86 (0.56–1.32)	1.14 (0.71–1.84)
Smoking status (compared to never smoker)				
Current smoker [†]	0.83 (0.72–0.95)	0.98 (0.85–1.14)	0.54 (0.42–0.71)	0.66 (0.45–0.96)
Former smoker	0.80 (0.53–1.20)	0.88 (0.55–1.41)	0.97 (0.54–1.75)	1.19 (0.59–2.40)
Male gender (compared to female)	1.14 (0.96–1.36)	1.09 (0.90–1.32)	0.84 (0.69–1.03)	1.02 (0.81–1.29)
Physician specialty (compared to internal medicine)				
Surgery [†]	0.65 (0.50–0.85)	0.86 (0.67–1.10)	0.47 (0.34–0.64)	0.68 (0.49–0.93)
Other ^{*†}	0.29 (0.22–0.38)	0.38 (0.28–0.50)	0.34 (0.27–0.42)	0.45 (0.35–0.59)

Reported values are odds ratios and 95% confidence intervals are reported in parentheses. Knowledge questions compare definite relationship to possible or no relationship.

^{*} $p < 0.05$ for multivariate analysis of asking patients about smoking status.

[†] $p < 0.05$ for multivariate analysis of advising smokers to quit