

# Knowledge, Attitudes and Practices about Smoking in a Group of Doctors in Bogotá, Colombia

## Conocimientos, actitudes y prácticas sobre tabaquismo en un grupo de médicos en Bogotá (Colombia)

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NELCI BECERRA <sup>a</sup>

Family Physician, Javesalud IPS, Bogotá, Colombia  
ORCID: <https://orcid.org/0000-0002-7516-8612>

CLAUDIA XIMENA ROBAYO GONZÁLEZ  
Master in Toxicology, Javesalud IPS, Bogotá, Colombia  
ORCID: <https://orcid.org/0000-0003-2101-7955>

DIANA DE LA ASUNCIÓN RAMÍREZ  
Family Physician, Department of Preventive and Social Medicine, Pontificia  
Universidad Javeriana, Bogotá, Colombia  
ORCID: <https://orcid.org/0000-0003-3066-453>

MARCELA SÁNCHEZ  
Family Physician, Department of Preventive and Social Medicine, Pontificia  
Universidad Javeriana, Bogotá, Colombia  
ORCID: <https://orcid.org/0000-0003-0242-2058>

LUZ HELENA ALBA  
Family Physician, Master in Clinical Epidemiology, Department of Preventive and  
Social Medicine, Pontificia Universidad Javeriana, Bogotá, Colombia  
ORCID: <https://orcid.org/0000-0002-6186-7842>

### ABSTRACT

**Introduction:** The smoking approach requires the understanding of practitioners' factors influencing clinical care of smokers. **Objective:** Identify behaviors, attitudes, and practices about smoking in a group of doctors in Bogotá, Colombia. **Materials and methods:** Descriptive cross-sectional study using the World Survey on Smoking in Health Professions Students applied to doctors in training from a higher education institution and doctors graduated from a health service provider institution. **Results:** It was applied to 200 subjects, with 80% participation. 72.5% were women; 68.1% were graduated doctors and 31.9% were doctors in training. A higher level of knowledge about the approach to smoking was found in physicians in training compared to graduate physicians (96.1% versus 70.6%;  $p < 0.01$ ). Cessation training was greater in physicians in training (82.4% versus 55.0%;  $p = 0.001$ ). The perception of physicians as role models for their patients was higher in graduate physicians (78.9% versus 62.7%;  $p = 0.04$ ). Prevalence of tobacco and electronic cigarette use were higher in physicians in training. **Conclusions:** Inquiring about knowledge, attitudes and practices in physicians broadens the understanding of their role in the control and approach of smoking. It is important to review the curricular content and reinforce continuing education on smoking.

### Keywords

health knowledge; attitudes; practice; tobacco use; tobacco products; smoking; tobacco use disorder; smoking cessation.

<sup>a</sup> Corresponding author: [nbecerra@javeriana.edu.co](mailto:nbecerra@javeriana.edu.co); [becerra.n@javeriana.edu.co](mailto:becerra.n@javeriana.edu.co)

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## RESUMEN

**Introducción:** Abordar el tabaquismo requiere comprender factores de parte de los profesionales que puedan influir en la atención clínica. **Objetivo:** Identificar comportamientos, actitudes y prácticas sobre tabaquismo en un grupo de médicos en Bogotá (Colombia). **Materiales y métodos:** Estudio descriptivo transversal mediante la Encuesta Mundial de Tabaquismo en Estudiantes de Profesionales de la Salud aplicada a médicos en formación de una institución de educación superior y médicos graduados de una institución prestadora de servicios de salud. **Resultados:** Se aplicó la encuesta a 200 sujetos, con una participación del 80 %. El 72,5 % correspondió a mujeres; el 68,1 %, a médicos graduados, y el 31,9 %, a médicos en formación. Se encontró un nivel mayor de conocimiento sobre el abordaje del tabaquismo en médicos en formación en comparación con los médicos graduados (96,1 % versus 70,6 %;  $p < 0,01$ ). El entrenamiento en cesación fue mayor en médicos en formación (82,4 % versus 55,0 %;  $p = 0,001$ ). La percepción de los médicos como modelos para sus pacientes fue mayor en los médicos graduados (78,9 % versus 62,7 %;  $p = 0,04$ ). Las prevalencias de consumo de tabaco y cigarrillo electrónico fueron más altas en médicos en formación. **Conclusiones:** Indagar sobre conocimientos, actitudes y prácticas en médicos amplía la comprensión de su rol en el control y abordaje del tabaquismo. Es importante revisar los contenidos curriculares y reforzar la educación continua en tabaquismo.

### Palabras clave

conocimientos; actitudes y prácticas en salud; uso de tabaco; productos de tabaco; hábito de fumar; tabaquismo; cese del tabaquismo.

## Introduction

Smoking continues to be a public health problem in the world, and although smoking prevalence rates have declined in response to tobacco control strategies (33.4% to 24.9% in 2000 and 2015, respectively), about eight million deaths are still reported annually, negatively impacting the individual and collective health of people in consuming countries (1, 2).

Continuing to decrease tobacco use is one of the goals of the Global Action Plan for the Prevention and Control of Noncommunicable Diseases (3), in line with the United Nations 2030 Agenda for Sustainable Development (4), which calls on countries to continue strengthening tobacco control through the implementation of the MPOWER strategy of the Framework Convention on Tobacco Control, which include: M: monitor tobacco consumption

and the implementation of tobacco control policies; P: protect the population from exposure to tobacco smoke; O: offer help to quit tobacco use; W: warn about the dangers of tobacco; E: enforce bans on tobacco advertising, promotion and sponsorship; R: increase tobacco taxes (5). Although significant progress has been made in the implementation of these measures in the Americas region, their application has not been homogeneous either among the measures or among the countries, the least implemented being banning tobacco advertising, promotion and sponsorship; increasing taxes on these products; and offering cessation assistance (6).

In the adult population, the rate of quit attempts is high (78 attempts per 100 smokers per year) and about half of smokers expects to quit within one year (7); however, only 3% succeed in quitting after one year without the necessary medical assistance, due to the triple dependence on tobacco (physical, psychological and social dependence) that requires a comprehensive, interdisciplinary and multi-component approach (8, 9).

The benefits of tobacco cessation are evident in both the short and long term, given the implications for the physical and mental health of the population (10,11). Treatment of tobacco dependence has been shown to increase cessation rates by 30% (12). Interventions with proven efficacy exist to help patients quit smoking (13) and cessation rates increase when health professionals systematically identify users, promote cessation attempts and provide therapeutic assistance for tobacco dependence, including counseling and pharmacological therapy (13,14). However, smoking cessation rates in primary care services remain low (15,16), as reported by La Torre et al. (17), who found that only half of smokers reported having been asked about their smoking habit, and of these, less than half received cessation interventions.

Tobacco use in health professionals is of particular interest in smoking surveillance, since they are not only responsible for approaching smoking patients and providing them with information and the necessary care for treating smoking, but also play a role as an example

and role model within the community (18). According to the results of the PESCE Project (19), physicians are among the most respected and trusted professionals for the smoking patient; however, only 30%-40% of smokers are advised by their primary care physician to quit smoking. Physicians tend to counsel more patients with overt smoking-related symptoms, and more heavy smokers than occasional smokers. It was also found that physicians are more likely to offer cessation counseling if they have received specific training. Likewise, physicians who are smokers are less likely to provide smoking cessation counseling than nonsmokers.

Local information on appropriation and application of knowledge for addressing smoking, as well as attitudes and practices related to tobacco use in medical students and graduate physicians is limited (20), so the purposes of this study were the following: 1) to determine the knowledge, attitudes, and practices about smoking in physicians in training (final-year undergraduate medical students) at a higher education institution and graduate physicians linked to a healthcare provider institution (IPS) in Bogotá (Colombia), 2) to explore possible differences between these two populations, and 3) to evaluate possible associated factors. From this perspective, the aim is to provide an input that promotes discussion and reflection processes that lead to the design and implementation of strategies to strengthen smoking cessation interventions offered by physicians and health professionals in general. This to favor the review and adjustment of academic programs in undergraduate and postgraduate health programs, and as continuous training and adherence to clinical practice guidelines in IPS, which allow strengthening smoking cessation care, within the framework of the implementation of cessation programs in Colombia.

## Materials and methods

This was a cross-sectional descriptive observational study that used the Pan American

Health Organization and the World Health Organization (21) Global Survey on Smoking in Health Profession Students as an instrument, provided by the area of disease prevention and control of these institutions in Colombia. The survey consisted of 43 questions distributed in 6 sections: demographic data (3 questions), tobacco consumption (9 questions), exposure to tobacco smoke (5 questions), attitudes (10 questions), knowledge (6 questions) and practices (7 questions). Questions on complementary demographic data, aspects of tobacco regulation in Colombia and prevalence of e-cigarette use were added. The questions were adapted to apply to both physicians in training (final year undergraduate medical students) and graduated physicians, with the purpose of establishing possible differences between the two groups.

The survey was applied to the universe of final-year undergraduate medical students of a higher education institution (90 physicians in training) and to the universe of physicians linked to an IPS (110 graduated physicians) between August and December 2018. The two institutions are located in the city of Bogotá (Colombia). In total, 200 surveys were sent and a response rate of 89.5% (179 participants) was obtained. The online questionnaire included a description of the purpose of the study and informed consent for its completion.

Statistical analysis was performed using the R statistical package, version 3.6.1. The descriptive analysis considered frequencies and percentages for categorical variables; in addition, the prevalence of ever use in the past year and in the past month was calculated according to the proportion of physicians who responded affirmatively to the specific question. For numerical variables, the mean with its corresponding standard deviations was calculated. The mean difference for age was obtained using Student's t-test, adjusted for unequal variances. With bivariate analyses, knowledge, attitudes and practices were compared between senior versus graduate physicians, using the chi-square test ( $\chi^2$ ) or Fisher's exact test in the analysis of proportions,

considering the p value with a significance level of less than 0.05. Additionally, the odds ratio (OR) was calculated using their respective 95% confidence intervals.

This study is classified as risk-free research, per the guidelines of Resolution 08430 of 1993 of the Colombian Ministry of Health, and complies with the international standards established in the 1964 Declaration of Helsinki and the ethical guidelines for biomedical research. It had the approval of the Ethics and Research Committees of the Pontificia Universidad Javeriana-Hospital Universitario de San Ignacio and Javesalud (Act 10/2018 of June 14, 2018 and Act 008/2018 of August 16, 2018, respectively).

## Results

Of the 179 participants, 19 were excluded due to an absence of data greater than 20%. A final participation of 80% (n = 160) of the total target population was achieved. The participants were classified into two categories: physicians in training (final year undergraduate medical students at an institution of higher education) and graduate physicians (general practitioners, resident and specialist physicians linked to an outpatient primary care IPS).

Of the total number of participants, 31.9% were physicians in training and 68.1% were graduates (46.8% general practitioners, 17.4% residents and 35.8% specialists), with an average age of 32.2 years. The demographic characteristics are presented in Table 1.

**Table 1**  
*Characteristics of the study population*

Variable	Physicians in training	Graduate physicians			Total Graduate physicians	P-value	Total
		General practitioners	Residents	Specialists			
Population (n [%])	51 (31.9)	51 (46.8)	19 (17.4)	39 (35.8)	109 (68.1)		160 (100)
Age (x, DS)	23.3 (1.05)	36.3 (9.48)	30.8 (3.05)	38.8 (8.47)	36.3 (8.72)	<0.001	32.2
		Gender (%)					
Male	31.4	21.5	21.1	33.3	25.7	--	27.5
Female	68.6	78.4	78.9	66.6	74.3	0.45	72.5
		Smoking prevalence (%)					
Lifelong	60.8	51	63.1	64.1	54.8	0.72	46.2
Year	23.5	--	5.2	--	0.9	<0.001*	8.1
Month	31.4	9.8	--	--	4.6	<0.001	13.1
Prevalence of electronic cigarette use	31.4	7.8	5.2	5.1	6.4	<0.001	14.3

\*Fisher's exact test.

Differences were found between physicians in training and graduate physicians with higher prevalence of consumption in physicians in

training for both conventional cigarettes (31.4 %; p < 0.001) and electronic cigarettes (31.4 %; p < 0.001).

In relation to knowledge of smoking among professionals surveyed, 98.6% reported knowing the risks associated with smoking and considered it important recording smoking status in the clinical history (99.5%); meanwhile, 84.3% said they were aware of the reasons why people smoke, with a higher level of knowledge among physicians in training than among graduates (96.1% versus 78.9%, respectively; p = 0.0118). Differences were also found in relation to formal training in cessation: there was a higher level of training in physicians in training than in graduate physicians (82.4% versus 55%, respectively; p = 0.0019). In the same sense, physicians in training have greater awareness of the use of pharmacological therapy for tobacco cessation, such as bupropion, compared to graduate physicians (96.1 % versus 70.6%; p = 0.00064).

Regarding attitudes related to smoking, for physicians who have never smoked, it is more annoying when someone smokes in their presence than for those who have ever been smokers (93.9% versus 77.3%; p < 0.0001). This perception is significantly higher in graduate physicians (89.9%) than in physicians in training (31.4%; p = 0.018). 98.2 % of the respondents think that health professionals should receive specific training in tobacco cessation, with no differences between graduate and non-graduate physicians. Similarly, 99.4% believe that health professionals should routinely advise their patients to stop smoking cigarettes, and 85.4% believe that it is necessary to advise their patients to stop using other tobacco products. Likewise, 73.6 % of the respondents believe that health professionals are role models (examples) for their patients and the community; however, this opinion predominates among graduate physicians (78.9 %) when compared to non-graduates (62.7 %; p = 0.04).

Regarding tobacco use and intention to quit, 17.6% of physicians in training made at least one quit attempt in the last year, and 9.8% of current smokers stated their current intention to quit (Table 2).

**Table 2**  
Smoking-related knowledge attitudes and practices

Question	Medical interns	Graduate physicians	Valor de p	Total
<b>Knowledge (%)</b>				
Risks associated with smoking	98.0	98.2	0.53*	98.6
Reasons related to smoking	96.1	78.9	<b>0.0118</b>	84.3
Recording in the medical record	100.0	99.1	1*	99.5
Formal cessation training	82.4	55.0	<b>0.0019</b>	63.7
Nicotine replacement therapy	96.1	95.4	1*	95.6
Bupropion	96.1	70.6	<b>0.00064</b>	90
Varenicline	52.9	54.1	0.93	53.8
Non-smoking protection policy	88.2	89.9	0.93	--
<b>Attitudes (%)</b>				
Discomfort associated with passive smoking exposure	31.4	89.9	<b>0.018</b>	82.5
Verbalizing the discomfort of exposure to the smoker	64.7	67.0	1	77.5
Opinion on the need for training	96.1	99.1	0.23*	98.2
Opinion of physicians as a model	62.7	78.9	<b>0.04</b>	73.6
Opinion on the need to counsel the smoker	98.0	100.0	0.31*	99.4
Opinion on the need to discourage the use of tobacco substitutes	80.4	88.1	0.4	85.4
Opinion on the influence of the physician's smoking status	92.2	95.4	0.46*	94.3
<b>Practices (%)</b>				
Attempt to quit smoking in the past year	17.6	2.8	0	7.4
Current desire to quit smoking	9.8	0.9	0	3.7

When assessing factors associated with smoking using bivariate analysis, we found that professionals younger than 32 years are more likely to be knowledgeable about how to approach smoking patients and provide tobacco cessation counseling (OR: 2.5; 95% CI: 1.2-5.2), as well as about the use of tobacco cessation medications such as bupropion (OR: 3.7; 95% CI: 1.6-9.3), compared to older physicians. However, younger physicians (under 32 years of age) consider health professionals less likely to be role models for their patients and the community (OR: 0.38; 95% CI: 0.15-0.86), in contrast to graduate physicians (OR: 2.3; 95% CI: 1.02-5.1). Female physicians were also found to be twice as likely to consider health professionals as role models for their patients and the community compared to male physicians (OR: 2.27; 95% CI: 1.00-5.15).

According to the level of training, graduate physicians were less likely to receive formal training in tobacco cessation, both in counseling interventions (OR: 0.26; 95%CI: 0.1-0.6) and pharmacological therapy for cessation (OR: 0.1; 95%CI: 0.01-0.7). Generally, the prevalence of use of tobacco, substitutes and electronic cigarettes is higher in men and in those under 32 years of age (Table 3).

**Table 3**  
Factors associated with physicians' knowledge and attitudes toward smoking

Variable	Knowledge (OR, 95% CI)			Attitudes (OR, 95% CI)	Prevalence of tobacco use (OR, 95% CI)	
	Brief counseling	Antidepressants	Motivations for smoking	The physician as role model	Tobacco	Electronic cigarette
<b>Gender</b>						
Female	1	1	1	1	1	1
Male	1.13 (0.54-2.35)	1.29 (0.3-3.6)	0.97 (0.35-2.98)	0.43 (0.2-0.94)	5.1 (1.8-15.05)	4.3 (1.7-11.3)
<b>Age</b>						
Over 32 years old	1	1	1	1	1	1
Under 32 years of age	2.5 (1.2-5.2)	3.7 (1.6-9.3)	2.3 (0.9-6.2)	0.38 (0.15-0.86)	1.5 (0.5-5.3)	5.9 (1.6-32.7)
<b>Level of education</b>						
Senior student	1	1	1	1	1	1
Graduate physician	0.26 (0.1-0.6)	0.1 (0.01-0.4)	0.1 (0.01-0.7)	2.3 (1.02-5.1)	0.5 (0.2-1.7)	0.1 (0.04-0.4)
<b>Smoker status</b>						
No	1	1	1	1	1	1
Yes	1.0 (0.5-2.0)	1.3 (0.6-3.1)	0.6 (0.2-1.7)	0.7 (0.3-1.6)	6.6 (1.4-66.4)	5.6 (1.6-31.1)

## Discussion

The prevalence of tobacco use in the last month in physicians in training (final year undergraduate medical students) found in this study (31.4%) is higher than that documented in the adult population both in the world (24.9%) and in the region of the Americas (20.1%) (22), and even than that reported in Colombia (13%) (23). Nevertheless, it is similar to that reported in similar populations in other Latin countries where the same instrument used in the present study (World Student Health Student Smoking Survey) was applied. In Mexico and Costa Rica, this prevalence corresponds to 33.3% and 32.2%, respectively (24), and is even lower than that reported in Chile (41.9%) (18).

In Colombia, in a study by Alba et al. (25), the prevalence of daily cigarette smoking in fifth-year undergraduate medical students at a university institution in Bogotá was 25.9%, compared to 27.8% in first-year students for the 2007-2011 academic period, with a decreasing trend during the career (p = 0.51). In another previous study published in 2001, Rosselli et al. (26) reported an overall prevalence of tobacco use in the first and fifth year medical students of 25.9%. The results obtained in this study suggest an increasing trend in tobacco use in medical students recently, although this assumption cannot be confirmed, considering that different instruments were used for data collection in the aforementioned studies. This could be related to the fact that although training in smoking cessation has been strengthened in university

curricula recently, apparently other individual aspects, the immediate context and the social environment have an important influence on their decision to smoke and their attitudes towards smoking (25). Individual factors such as the stage of their life course in which they find themselves (youth) and other factors such as the level of stress they face in their training process, the shortage of time to practice sports and factors related to the context, such as the fact that although the university restricts the possibility of smoking in enclosed spaces, there is no total prohibition of consumption; the above added to the highly addictive effect of nicotine.

In this regard, three areas related to the transition between the intention and decision to use tobacco have been postulated: the biological and personality area, the social environment, and the culture or environment (27, 28). In the specific case of medical students, it is important to consider that many initiate consumption before entering university, and in some cohorts an increase in consumption during the career has been reported (26). Cheesman and Suárez (29) found as risk factors for initiating tobacco use in medical students at a university in Guatemala: stress (23.6%), imitation of professors (18.2%) and fashion (10.4%), with the university environment being the place of greatest frequency of consumption. They also found inadequate attitudes towards smoking, male sex, lack of self-confidence, poor family communication, having friends who smoke and not receiving information about smoking as factors favoring consumption.

Regarding the prevalence of tobacco use in graduate physicians, a study in a population of Colombian physicians (30) reported a lifetime prevalence of 68.68%, higher than that obtained in this study for the same population group (54.8%).

When inquiring about the use of electronic cigarettes, there is a lifetime prevalence of 31.4% in students in their last year of medical school, double the prevalence obtained in the National Survey of Smoking in Young People in Colombia (15.4%) (31). The high use of this type of device in the population evaluated could be

related to limited information on the health effects of the use of this type of nicotine delivery device, a consequence of a still insufficient level of evidence and a possible interference of the tobacco industry in the promotion of this type of devices offered as "lower risk products" than conventional cigarettes, in the absence of legislation in force to inform and protect potential consumers (32,33). A study conducted with medical students at the University of Minnesota (34) found that 94.8% of participants considered that they had not received adequate education on the use of electronic cigarettes during their medical training, and this reinforces the importance of including this topic in the curricular content of the academic programs of health careers.

The results of this study show that higher consumption of both conventional cigarettes (OR: 5.1; 95%CI: 1.8-15.05) and electronic cigarettes (OR: 4.3; 95% CI: 1.7-11.3) continues to be more prevalent in the male population, similar to the rest of the world (40.3% in men versus 9.5% in women) (22) and in Colombia (men 18.8% and women 7.4%) (23), as well as in specific populations. In a population of Colombian adolescents, for example, lifetime cigarette smoking in vocational high school students was associated with male sex (OR: 4.4%; 95% CI: 1.63-3.56) (35). Pardo and Piñeros (36) also found a higher prevalence of consumption in men (31.4% versus 22.2% in women).

However, a gradual decrease in tobacco consumption in both women and men has been reported, according to the results of the World Health Organization's global report on trends in tobacco consumption prevalence in 2000-2025, which shows a reduction of 60 million tobacco users in response to control strategies (3). However, despite the aforementioned decrease, the higher prevalence of consumption in men continues to occur in different populations, especially in young people (37), and could be related in our environment with less social pressure regarding the need to quit in this group, associated with the fact that for cultural reasons there is greater permissibility regarding the practice of risky behaviors in men, despite

the positioning of women in recent decades and greater self-care in women related to the prospect of motherhood.

In relation to the perceptions on smoking treatment by the health professionals surveyed and taking into account that the majority (99.4%) consider it necessary to advise smoking patients to quit smoking, the findings coincide with data from other countries, such as Mexico (94.9%), Chile (95.7%) and Paraguay (100%) (18,24,38), and with the study by Robayo-González and Uribe-Caputi (30), in which 98.4% of the surveyed health professionals considered it necessary to advise smokers to quit smoking, 7% and Paraguay (100%) (18, 24, 38), and with the study by Robayo-González and Uribe-Caputi (30), in which it was found that 98.4% of a population of Colombian physicians believe it is necessary to receive training in cessation techniques and 90.5% think that health professionals should routinely recommend smoking cessation methods to patients. The above reinforces the importance of continuing to strengthen curricular content in health careers related to smoking control at all levels of training (undergraduate, graduate and continuing medical education).

Regarding the self-perception of the respondents regarding the fact of being models for their patients, there are results similar to those reported in the previously mentioned studies (68.8 % in Chile, 77.3% in Mexico, 69.2% in Paraguay); however, a significant difference in the perception of the model role is striking in this study since it is lower in the final year medical students compared to graduated physicians (62.7% versus 78.9 %). Simultaneously, it is still lower than that reported by Robayo-González and Uribe-Caputi (30) in a population of Colombian physicians (86.5%). This would seem to evidence a discrepancy between the knowledge and attitudes of younger physicians, because although the new generations know more about the subject and have had greater opportunities for training in tobacco cessation techniques, the prevalence of tobacco use is higher and the perception of their role as a role model is lower. In this sense, it is necessary to

consider some factors that may influence the behaviors of younger physicians, such as career stress, time to have a healthy lifestyle or the role of the university environment and social context, considering that some of these factors require actions beyond the scope of university training.

The results also corroborate the need to reinforce continuous training for treating smoking, since only 55% of the graduate physicians who participated in this study reported having formal training in cessation techniques, in contrast to the physicians in training (83.4%). This result, however, is slightly higher than that reported by Robayo-González and Uribe-Caputi (30), in which only 48.8% of the Colombian physicians surveyed had had cessation training and is consistent with the first study conducted in this regard in Colombia, by Rosselli et al. (26), in a sample of medical students from seven Colombian cities, in which 21.5% of first-year medical students stated that their current knowledge was appropriate for cessation counseling, compared to 58.3% of fifth-year students. Clearly, as the medical undergraduate program progresses, knowledge on this subject improves; however, as mentioned, this situation does not guarantee a favorable attitude towards discouraging consumption by patients or the adoption of healthy personal practices such as not smoking. Therefore, it is desirable that universities continue to strengthen their policies in relation to being completely smoke-free spaces and continue to optimize educational, sports, recreational and cultural spaces that favor a healthy lifestyle.

The maintenance of health risk behaviors, such as tobacco use, sedentary lifestyles, inadequate diet, alcohol consumption, among others, is determined by social acceptance, the perception of risk and the ease of practicing them; it is common to find several risk behaviors together in the same person. Thus, tobacco use is usually associated with the adoption of other unhealthy lifestyles (39, 40). The strengthening of educational institutions as healthy universities continues to be a fundamental pillar to promote interventions aimed at changing the population pattern of the

main risk factors for non-communicable diseases through the implementation of interventions and programs, surveillance and evaluation, and health education and research (41).

Alternatively, it is evident that younger physicians have more solid knowledge on cessation, despite their higher prevalence of consumption and their lower perception of their role as role models for their patients. This could be related to the strengthening of medical curricula recently, in response to a national tobacco control policy, but also to contextual and age-specific circumstances that could explain the discrepancy between knowledge, attitudes and practices.

Some successful experiences could be imitated in the local context, such as the one implemented by the Education Against Tobacco network, in which more than 3500 medical students and physicians perform volunteer work in approximately 80 medical schools in 14 countries, through elective courses on tobacco control strategies and consumption prevention, aimed at high school students between 10 and 15 years of age, which has already encouraging results on the protective effect of this community intervention with respect to smoking initiation, especially among female students, with a low level of education and with a migratory background (42, 43).

The limitations of this study include the fact that the survey was applied to a group of physicians in training at a university and to a group of physicians at an IPS in Bogota, which conditions the extrapolation of the results to other similar populations. Likewise, the medical curriculum of the participating university is not necessarily representative of the curriculum of other medical schools. For future research, it is recommended to apply the survey in different universities, including other healthcare careers and professionals graduated from different primary care centers, so that with a larger sample, we can compare the knowledge, attitudes and practices according to different curricula, at different times of medical training (undergraduate, postgraduate and continuing

education), considering the age and time of professional practice of the graduated physicians.

## Conclusions

Exploring the knowledge, practices and attitudes regarding smoking allows to broaden the understanding of the physician's role in tobacco control in the primary healthcare setting, identifying the need to review and adjust the curricular contents related to this topic in undergraduate and postgraduate academic training programs in health, in addition to reinforcing continuing education for practicing professionals, with the purpose of strengthening the implementation of interventions for tobacco control in different settings.

According to the findings, formal training in tobacco cessation is better in younger physicians and the possibility of having more training in tobacco cessation issues is associated with a greater likelihood of applying tobacco control interventions in their patients; However, this does not necessarily guarantee assuming the role as a role model for patients or avoiding the use of tobacco products and substitutes, so in addition to strengthening the curriculum and continuing education, it is necessary to continue implementing strategies that promote attitudinal changes and adoption of healthy habits and lifestyles that favor informed decision making through education strategies on the risks of consumption (tobacco products and substitutes, including electronic cigarettes), in addition to continuing to advance in the implementation of tobacco control policies in school, university, health and community settings. .

## Conflict of interest

The authors of this manuscript declare that they have no conflicts of interest.

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