

# Smoking-Related Attitudes and Knowledge Among Medical Students and Recent Graduates in Argentina: A Cross-Sectional Study

M. Victoria Salgado, Raúl M. Mejía, Celia P. Kaplan & Eliseo J. Pérez-Stable

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**FROM THE EDITORS DESK**

1109 • Guns, Doctors and Public Health  
*M.D. Feldman*

**EDITORIAL AND COMMENT**

1111 • Experiences with POLST: Opportunities for Improving Advance Care Planning  
*U.K. Braun*

1113 • Putting the Conversation about Gun Ownership and Safety in Context  
*W. Shelton*

1115 • The Big Phish: Cyberattacks Against U.S. Healthcare Systems  
*A. Wright et al.*

**ORIGINAL RESEARCH**

1119 • Use of the Physician Orders for Life-Sustaining Treatment among California Nursing Home Residents  
*L.A. Jennings et al.*

1127 • Incident Type 2 Diabetes Risk is Influenced by Obesity and Diabetes in Social Contexts: A Social Network Analysis  
*S. Raghavan et al.*

1134 • Effects of Global Payment and Accountable Care on Tobacco Cessation Service Use: An Observational Study  
*H.A. Huskamp et al.*

1141 • Assessing Problematic Substance Use in HIV Care: Which Questions Elicit Accurate Patient Disclosures?  
*W. Callon et al.*

1148 • Inadequate Systems to Support Breast and Cervical Cancer Screening in Primary Care Practice  
*M.M. Schapiro et al.*

1156 • BMI Trajectories as a Harbinger of Pre-Diabetes or Underdiagnosed Diabetes: an 18-Year Retrospective Cohort Study in Taiwan  
*C.-J. Chiu et al.*

1164 • Quantifying the Severity of a Delirium Episode Throughout Hospitalization: the Combined Importance of Intensity and Duration  
*S. Vasanthakumari et al.*

1172 • Describing Failure in a Clinical Clerkship: Implications for Identification, Assessment and Remediation for Struggling Learners  
*J.J. Nixon et al.*

1180 • The Development and Evaluation of an Online Healthcare Toolkit for Autistic Adults and their Primary Care Providers  
*C. Nicolaidis et al.*

1190 • Association Between Primary Care Visits and Colorectal Cancer Screening Outcomes in the Era of Population Health Outreach  
*E.A. Halm et al.*

1198 • Effect of Gaining Insurance Coverage on Smoking Cessation in Community Health Centers: A Cohort Study  
*S.R. Bailey et al.*

1206 • The Primary Care PTSD Screen for DSM-5 (PC-PTSD-5): Development and Evaluation Within a Veteran Primary Care Sample  
*A. Prins et al.*

**REVIEW**

1222 • Primary Care Physicians' Perspectives of Their Role in Cancer Care: A Systematic Review  
*R.A. Lawrence et al.*

**PERSPECTIVE**

1237 • Forgiven but not Relieved: US Physician Workforce Consequences of Changes to Public Service Loan Forgiveness  
*A.B. Friedman et al.*

**HEALTH POLICY**

1242 • Physicians Asking Patients About Guns: Promoting Patient Safety, Respecting Patient Rights  
*B. Parent*

**INNOVATION AND IMPROVEMENT**

1246 • Improvement Happens – Learning to Better Care for “Super-Utilizers” at Denver Health: An Interview with Holly Batal  
*M. Hochman*

**CLINICAL PRACTICE: CLINICAL VIGNETTES**

1254 • Quinine and the ABCs of Long QT: A Patient's Misfortune with Arthritis, (Alcoholic) Beverages, and Cramps  
*E.T. Sheehan et al.*

**CLINICAL IMAGES**

1258 • Generalized Pustular Psoriasis Associated with Shock  
*S. Pitukweerkul and S. Pilla*

1260 • Catamenial Pneumothorax  
*K. Shikino et al.*

1261 • Bilateral Nephrocalcinosis in Primary Distal Renal Tubular Acidosis  
*S. Pitukweerkul et al.*

**HEALING ARTS: MATERIA MEDICA**

1262 • Dressed for the Party  
*M. Goldberg*

1263 • Hemodialysis is Indicated  
*J. Graham*

Full contents inside

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# Smoking-Related Attitudes and Knowledge Among Medical Students and Recent Graduates in Argentina: A Cross-Sectional Study

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**BACKGROUND:** Physicians in Argentina smoke at rates similar to the general population, and do not have a clear role in tobacco control strategies.

**OBJECTIVE:** To describe the attitudes and knowledge of medical students and recent graduates towards smoking behavior in Argentina.

**DESIGN:** Cross-sectional self-administered online survey conducted in 2011.

**PARTICIPANTS:** Medical students and recent medical graduates from the University of Buenos Aires.

**MAIN MEASURES:** Attitudes and knowledge were evaluated by responses to 16 statements regarding the effects of smoking cigarettes and the role of physicians in tobacco control. Rates of agreement with a full ban on indoor smoking in different public settings were assessed.

**KEY RESULTS:** The sample included 1659 participants (response rate: 35.1 %), 453 of whom (27.3 %) were current smokers. Only 52 % of participants agreed that doctors should set an example for their patients by not smoking, 30.9 % thought that medical advice had little effect on patients' cessation behavior, and 19.4 % believed that physicians could decline to care for smoking patients who failed to quit. In adjusted logistic regression models, current smokers had less supportive attitudes about tobacco control and were less likely than non-smokers to agree with a full indoor smoking ban in hospitals (OR: 0.30; 95 % CI 0.16–0.58), universities (OR: 0.55; 95 % CI 0.41–0.73), workplaces (OR: 0.67; 95 % CI 0.50–0.88), restaurants (OR: 0.42; 95 % CI 0.33–0.53), cafes (OR: 0.41; 95 % CI 0.33–0.51), nightclubs (OR: 0.32; 95 % CI 0.25–0.40), and bars (0.35; 95 % CI 0.28–0.45). Recent medical graduates had more accurate knowledge about cessation and were more likely to agree with a full smoking ban in recreational venues.

**CONCLUSIONS:** Although most participants reported a strong anti-tobacco attitude, a proportion still failed to recognize the importance of their role as physicians in tobacco control strategies. Current smokers and current

students were less likely to support indoor smoking bans. Specific educational curricula could address these factors.

**KEY WORDS:** smoking; medical students; attitudes; Latin America. J Gen Intern Med

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## INTRODUCTION

Physicians play an important role in tobacco control by offering a point-of-care cessation counseling option, although studies have found that they often do not assess their patients' smoking status, provide only limited advice, and do not offer cessation treatment as regularly as they should.<sup>1–4</sup> However, physicians not only have the potential to help their patients quit smoking; they are also considered “role models.”<sup>5</sup> Although training physicians on tobacco cessation improves their adherence to smoking treatment guidelines, their counseling performance may ultimately have little impact on the smoking status of their patients.<sup>6–10</sup> Moreover, while positive attitudes towards cessation advice appear to be correlated with greater odds of providing such advice,<sup>11</sup> physicians' perceptions of the effectiveness of and recommendation of cessation counseling may be negatively affected by their personal smoking status.<sup>12, 13</sup> Therefore, the study of health professionals' attitudes towards smoking and tobacco control offers an opportunity for analyses that may result in new strategies focused mainly on providing training.<sup>14</sup>

Considering that medical students are “soon to be” physicians, their smoking behavior and attitudes have been the object of multiple studies around the world.<sup>15–21</sup> Smoking prevalence among physicians has declined in most high-income countries, but it remains highly variable in middle-income countries,<sup>22–24</sup> including among medical students.<sup>25</sup> Smoking prevalence among US students in the health profession is close to 7 %.<sup>26</sup> In Europe, it ranges from 3.8 % in Wales<sup>27</sup> to 22.1 % in Germany<sup>28</sup>; in Asia, from 2.1 % in Thailand<sup>29</sup> to 66.9 % among Chinese men.<sup>30</sup> Among Latin American countries, it was estimated that 16.9 % of Brazilian

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medical students were current smokers, while this proportion was reported to be 41.1 % in Bolivia.<sup>29</sup>

Argentina is a high-middle-income South American country with a smoking rate of 22.1 %.<sup>31</sup> Previous research has shown that rates of smoking among medical students in Argentina are at least as high as those in the general population.<sup>19, 32, 33</sup> The School of Medicine at the University of Buenos Aires (UBA) is the largest in the country; students enroll after graduating from high school, with completion in about 7 years.<sup>34</sup> A previous survey conducted among its medical students found that more than 90 % thought that health professionals should receive specific training on smoking cessation techniques, but less than 10 % reported having any training in medical school.<sup>33</sup> Although this survey partially addressed UBA medical students' attitudes and knowledge about tobacco, these topics are in need of further exploration. Studies have shown that media images of smoking, particularly in movies, are linked to smoking and smoking initiation among adolescents.<sup>35–40</sup> Therefore, media literacy—or the ability to analyze and evaluate media messages<sup>41</sup>—has been proposed as a tool to better interpret media messages related to smoking, potentially influencing attitudes towards smoking and smoking behavior. Prior studies have shown an association between the level of smoking media literacy and smoking status among adolescents in the USA and in Jujuy, Argentina, as well as in US college students.<sup>42–44</sup> In a previous article, we analyzed access to tobacco company websites among medical students from UBA.<sup>45</sup> The objective of the present paper is to describe the attitudes and knowledge of these medical students and recent graduates towards smoking and smoking behavior, including their level of smoking media literacy, based on their smoking status.

## METHODS

### Study Procedures

In 2011, current and former UBA medical students were invited through email communication to participate in a one-time self-administered online survey. Email addresses were obtained from the registry of the required 1-year rotating internship (the last practice-based year of medical school before graduation), the pharmacology department of the UBA School of Medicine, and the main university teaching hospital. Datstat Illume software was used to conduct the survey.<sup>46</sup> Over the course of 11 weeks, one initial email and 14 reminder messages were sent requesting participation. The links allowing access to the questionnaire were disabled after the last email resulted in no new responses. Inclusion criteria were age of 18–30 years, responding to smoking status questions, and status as current or recent medical student at UBA School of Medicine. The institutional review committee of the Hospital de Clínicas, UBA, approved the study protocol. A

more detailed description of data collection methods as well as the instrument development was described previously.<sup>45</sup>

### Smoking Behavior Variables

The questionnaire included questions regarding participants' demographic characteristics, cigarette consumption, tobacco dependence, knowledge about tobacco and tobacco cessation, attitudes towards smoking, and smoking media literacy. A participant was considered a current smoker if he/she reported to have smoked a cigarette in the 30 days prior to the survey. A former smoker was someone who reported to have smoked cigarettes in the past but not within the previous 30 days. A never smoker had never tried a cigarette. Among current smokers, nicotine dependence was assessed using the Heaviness of Smoking Index, through two items of the Fagerström Test for Nicotine Dependence. Item 1 was time from waking to first cigarette, and item 4 was the number of cigarettes smoked per day (each score from 0 to 3). A participant was considered to have high nicotine dependence when the score was  $\geq 4$ .<sup>47–49</sup>

### Attitudes and Knowledge About Tobacco Use

Tobacco-related attitudes and knowledge were evaluated using a five-item Likert scale (from “strongly agree” to “strongly disagree”) for 16 statements regarding the role of doctors in tobacco control, attitudes towards patients who smoked, effects of smoking, and effectiveness of counseling and smoking cessation treatment.<sup>9</sup> Statements were adapted from a questionnaire used in a clinical study with Argentine physicians.<sup>9</sup> Content validity was evaluated by cognitive interviews with ten UBA medical students. Factor analysis did not support acceptable psychometric properties for use as an attitudes and knowledge scale. Thus, the analysis was planned with individual items as outcomes.

The “agree” and “strongly agree” options and the “disagree” and “strongly disagree” options were combined into a single category (“agree” or “disagree”). The neutral option (“neither agree nor disagree”) was differentially assigned to the response group that did not indicate an anti-smoking attitude or that did not correctly answer a knowledge question. For example, when the anti-smoking attitude or the correct knowledge answer implied “agreeing” with the statement, the neutral option was included among the “disagree” responses; when it implied “disagreeing” with the statement, the neutral option was included among the “agree” responses. Participants were also asked about their level of agreement with banning indoor smoking in various public places.<sup>9, 33</sup> The questionnaire is in Online Appendix 1 in both Spanish and English.

### Smoking Media Literacy

Smoking media literacy was assessed with a smoking media literacy (SML) scale,<sup>50</sup> developed and used in the USA, and adapted for Argentine youth.<sup>42–44</sup> The original scale has 18



items divided into three domains: authors and audiences (AA), messages and meanings (MM), and representation and reality (RR). As a result of cognitive interviews conducted for trans-cultural adaptation, five items were deemed not relevant; therefore, the final version of the scale consisted of 13 of the 18 items. Items used included the following: "Tobacco companies are very powerful, even outside of the cigarette business." (AA); "When people make movies and TV shows, every camera shot is very carefully planned." (MM); and "Advertisements usually leave out a lot of important information." (RR). Each statement was evaluated using a four-point Likert scale, from "strongly disagree" (1 point) to "strongly agree" (4 points). Based on previous reports, high smoking media literacy was defined as an average score  $\geq 3$ .<sup>43, 44</sup> After the survey was conducted, confirmatory factor analysis was used to verify adjustment to the original model. The complete list of all items used is available upon request.

## Data Analysis

Data analysis was conducted using STATA software version 13 (StataCorp LP, College Station, TX, USA). Statistical significance was defined with a two-sided alpha of 0.05 ( $P$  values  $< 0.05$ ). Descriptive analysis was used to compare respondents by sex. Chi-square tests were used for categorical variables. Logistic regression models were used to explore the association between the various attitude statements and opinions on banning indoor smoking and status as current smoker or recent graduate. Models using current smoking as outcome were designed to explore its association with the level of smoking media literacy (high or low). All models for both responses to attitudes, knowledge and full smoking ban, and SML were adjusted for age, gender, smoking status and student status.

## RESULTS

Of the 4969 persons included in the database, 1743 (35.1 %) completed the survey, but 84 were excluded from analysis for not meeting the inclusion criteria. The final sample consisted of 1659 participants (33.4 % of the 4969 original); of these, 1212 (73.1 %) were women, 447 (26.9 %) were men and 55.7 % were current medical students; 12 participants (0.7 %) reported to have dropped out of medical school before graduation. The majority of the recent medical graduates (605/723, 83.7 %) had completed medical school in the 2 years prior to the survey (median: 2010; interquartile range: 1), and 99.2 % of graduates had completed medical school in the 5 years prior to the survey. Table 1 presents the demographic and tobacco consumption characteristics. Among respondents, 453 (27.3 %) were current smokers at the time of the survey; 311 (18.7 %) were daily smokers. Almost all current smokers reported low nicotine dependence (434; 95.8 %). A more detailed description of the population and of current smokers' characteristics can be found in a previous publication.<sup>45</sup>

**Table 1 Demographic Characteristics and Smoking Behavior Among 1659 Current Students and Recent Graduates, by Gender, at the University of Buenos Aires Medical School, Argentina, 2011**

	Men ( <i>n</i> = 447) No. (%)	Women ( <i>n</i> = 1212) No. (%)	Total ( <i>n</i> = 1659) No. (%)
Age (years):			
20–25	131 (29.3)	372 (30.7)	503 (30.3)
26–27	162 (36.2)	456 (37.6)	618 (37.3)
28–30	154 (34.5)	384 (31.7)	538 (32.4)
Student status:			
Currently enrolled student	258 (57.7)	666 (55.0)	924 (55.7)
Graduated as physician	188 (42.1)	535 (44.1)	723 (43.6)
Dropped out of medical school	1 (0.2)	11 (0.9)	12 (0.7)
Smoking status:			
Never smoker	92 (20.1)	256 (21.1)	348 (21.0)
Former smoker	225 (50.3)	633 (52.2)	858 (51.7)
Current smoker (total)	130 (29.1)	323 (26.7)	453 (27.3)
Current smoker (daily)	89 (19.9)	222 (18.3)	311 (18.7)
Current smoker (non-daily)	41 (9.2)	101 (8.3)	142 (8.6)

## Attitudes and Knowledge

Table 2 presents the level of agreement with different statements regarding attitudes and basic tobacco control knowledge by smoking status. In addition, 84.6 % of participants answered that medical students need more training on how to counsel patients on smoking cessation. Current smokers were significantly less likely than non-smokers to indicate a desire for more training (79.9 % vs. 86.4 %, respectively;  $P < 0.05$ ).

Recent medical graduates had more accurate knowledge about tobacco control strategies than did current medical students. These results are summarized in Online Appendix 2 (Table 2a).

Participants were also asked about their agreement with banning indoor smoking in various public places; Table 3 presents the results by smoking status. Overall, participants were less likely to agree with a full smoking ban in recreational venues, even though over 90 % agreed with a ban in health care settings, schools and public transportation. In addition, current smokers were significantly even less inclined to agree with a full smoking ban in seven different sites. Current medical students were also less likely to agree with full smoking bans in recreational venues. Analysis by student status can be found in Online Appendix 2 (Table 3a).

## Multivariate Analysis

Adjusted logistic regression models were used to assess the association between current smoker or recent medical graduate status and agreement with the attitudinal or knowledge statements and with a full smoking ban in public places. Table 4 presents the items in which a significant difference between current smokers and non-smokers was observed. Analyses by student status showed that recent graduates were significantly less likely to have selected smoking and cessation misconceptions and more likely to support a full smoking ban in recreational venues.

**Table 2 Knowledge and Attitudes Towards Smoking Among 1659 Current Students and Recent Graduates, by Smoking Status, University of Buenos Aires Medical School, Argentina, 2011**

Attitudes	Total (n = 1659)	Current smokers (n = 453)	Non-smokers (n = 1206)
	Agree No. (%)	Agree No. (%)	Agree No. (%)
It is doctors' responsibility to help their patients quit smoking.*	1412 (85.1)	371 (81.9)	1041 (86.3)
The physician has a responsibility not to smoke and set a good example for their patients*	863 (52.0)	157 (34.7)	706 (58.5) ‡
Regarding smoking cessation, medical advice has little effect on the behavior of patients.†	512 (30.9)	142 (31.4)	370 (30.7)
If a doctor wishes, he/she should be able to refuse to care for a patient just because he does not quit smoking.†	322 (19.4)	61 (13.5)	261 (21.6) ‡
It is useless to advise patients to quit smoking.†	142 (8.6)	38 (8.4)	104 (8.6)
The consumption of tobacco is a matter of personal decision, in which the doctor should not intervene.†	138 (8.3)	48 (10.6)	90 (7.5) §
Patients already have too many problems to add to quit smoking.†	73 (4.4)	25 (5.5)	48 (4.0)
Patients already know they should quit smoking It doesn't make sense to remind them of this.†	95 (3.9)	20 (4.4)	45 (3.7)
It is best to use physician time on other things rather than advising patients to quit smoking.†	59 (3.6)	16 (3.5)	43 (3.6)
<b>Knowledge</b>			
Tobacco consumption is an addiction.*	1590 (95.8)	424 (93.6)	1166 (96.7)
Of the patients who quit smoking, the majority succeed to do so on their first attempt.†	325 (19.6)	84 (18.5)	241 (20.0)
Smoking on non-daily basis is not harmful to health.†	99 (6.0)	39 (8.6)	60 (5.0)
Tobacco smoke in the environment (passive smoking) is only harmful to young children.†	63 (3.8)	19 (4.2)	44 (3.7)
Very light smoking (1–5 cigarettes per day) is harmless to health.†	51 (3.1)	23 (5.1)	28 (2.3)
If a patient has smoked for a long time, it is too late to stop, because the patient won't be able to do it.†	32 (1.9)	10 (2.2)	22 (1.8)
If a patient has smoked for a long time, it is too late to stop, because their health is already irreversibly affected.†	25 (1.5)	10 (2.2)	15 (1.2)

Note: Non-smoker category includes never smokers and former smokers

\*Statements in which the option "neither agree nor disagree" is included among the "disagree" responses

† Statements in which the option "neither agree nor disagree" is included among the "agree" responses

Non-smoker category includes never smokers and former smokers

Significant difference between current and non-smokers: ‡ $P < 0.001$ ; § $P = 0.027$ ; || $P = 0.003$

Men were more likely than women to agree with the following statements: "Patients already have too many problems to add to quit smoking." (OR: 1.85, 95 % CI 1.14–2.99,  $P = 0.013$ ); "If a patient has smoked for a long time, it is too late to stop, because the patient won't be able to do it." (OR: 2.57, 95 % CI 1.26–5.22,  $P = 0.009$ ); "It is best to use physician time on other things rather than advising patients to quit smoking." (OR: 3.17, 95 % CI 1.86–5.41,  $P < 0.001$ ); and "If a doctor wishes, he/she should be able to refuse to care for a patient just because he does not quit smoking." (OR: 1.34, 95 % CI 1.03–1.76,  $P = 0.031$ ). No differences between genders were found when asked their opinions on banning smoking in public places.

### Smoking Media Literacy

Most participants reported high SML scores (1458, 87.9 %). A statistically significant difference between current smokers and non-smokers was found only for the following individual items:

- "Tobacco companies are very powerful, even outside of the cigarette business." (total agreement: 87.2 % vs. 98.8 % respectively,  $P = 0.02$ )
- "There are often hidden messages in cigarette ads." (total agreement: 80.9 % vs. 85.2 % respectively,  $P = 0.04$ )
- "Most movies and TV shows that show people smoking make it look more attractive than it really is." (total agreement: 83.7 % vs. 90.6 % respectively,  $P < 0.01$ )

Logistic regression models did not show a significant association between SML scores and smoking status (current vs. non-smokers): OR 0.82, 95 % CI 0.57–1.18,  $P = 0.29$  in the unadjusted model; and OR 0.80, 95 % CI 0.55–1.16,  $P = 0.24$  in the adjusted model.

### DISCUSSION

This study analyzed the attitudes towards smoking, knowledge about smoking, and the level of smoking media literacy among students of the largest and most prestigious medical school in Argentina. In contrast to what has happened in most high-income countries, where a decline in smoking prevalence among physicians preceded a decline in the general population, the smoking rate among medical students and recent graduates was similar to that in the general population. This high prevalence is particularly concerning considering that the potential positive impact of health professionals on public policies may be diminished by their own high smoking prevalence. We found that only half of participants agreed that doctors should act as an example to their patients, around one third thought that medical advice had little effect on patients' cessation behavior, and nearly 20 % believed that physicians could decline care for patients who were smokers and failed to quit.

Current smokers were generally less likely to reveal an anti-smoking attitude when asked about physicians' role in tobacco

**Table 3 Level of Agreement with Banning Smoking in Public Places Among 1659 Current Students and Recent Graduates, by Smoking Status, University of Buenos Aires Medical School, Argentina, 2011**

Place	Agree with a full smoking ban		
	Total (n = 1659) No. (%)	Current smokers (n = 453) No. (%)	Non-smokers (n = 1206) No. (%)
Physicians' offices	1612 (97.2)	427 (94.3)	1185 (98.3)
Public transportation	1606 (96.8)	426 (94.0)	1180 (97.8)
Schools	1597 (96.3)	422 (93.2)	1175 (97.4)
Hospitals	1581 (95.3)	410 (90.5)	1171 (97.1)*
Universities	1384 (83.4)	342 (75.5)	1042 (86.4)*
Workplaces	1343 (81.0)	338 (74.6)	1005 (83.3)†
Restaurants	1116 (67.3)	234 (51.7)	882 (73.1)*
Coffee shops	1030 (62.1)	206 (45.5)	824 (68.3)*
Nightclubs	913 (55.0)	154 (34.0)	759 (62.9)*
Bars	897 (54.1)	158 (34.9)	739 (61.3)*

Note: Totals may not add to 100 % due to missing data  
 Non-smoker category includes never smokers and former smokers  
 Significant difference between current and non-smokers: \*P < 0.001;  
 †P = 0.004

control, especially with regard to being role models, while non-smokers and men were more likely to stigmatize patients who smoked and were unable to quit. Current medical students were less likely to correctly answer some of the knowledge questions and to recognize the importance of health professionals in helping patients to successfully quit smoking, which may be due to less clinical experience in observing the effects of tobacco use.

Our results were largely consistent with those found in other studies, in which medical students expressed a need for more training, and current smokers were less likely to have anti-smoking attitudes.<sup>15, 19–21, 33</sup> Even though most participants answered the knowledge-related questions correctly, most expressed a need for more training on tobacco cessation. Although a majority of respondents reflected an anti-smoking attitude, these results indicate that a significant number of medical students and young physicians do not believe that they have a greater responsibility in tobacco control just by virtue of being in a health-related profession.

Although indoor smoking bans have become widely accepted worldwide, including in Argentina, roughly one third to one half of respondents did not think that smoking should be fully banned in recreational venues such as cafes, which is similar to findings in other studies.<sup>20, 21</sup> This contradicts the fact that over 96 % of respondents correctly disagreed that second-hand smoke is harmful only to young children, and implies that though most understand that second-hand smoking is harmful, exposure by consenting adults in recreational venues may be acceptable. Another possible explanation could be a belief that the rights of nonsmokers should not prevail in places where their presence is purely recreational and voluntary. This contrasted with more than 80–90 % agreement among participants with a full smoking ban at work, health care and educational settings. Even though the reasons

**Table 4 Odds of Agreeing with a Specific Attitude/Knowledge Statement or with a Full Smoking Ban Among 1659 Current Students and Recent Graduates, by Smoking Status and Student Status, University of Buenos Aires Medical School, Argentina, 2011**

Statement	Odds of agreement (current smokers) <sup>a</sup> OR (95 % CI)
Analysis according to smoking status (non-smokers as referent)	
The physician has a responsibility not to smoke and set a good example for their patients.	0.39 (0.31–0.48) <sup>b</sup>
If a doctor wishes, he/she should be able to refuse to care for a patient just because he does not quit smoking.	0.57 (0.42–0.78) <sup>b</sup>
The consumption of tobacco is a matter of personal decision in which the doctor should not intervene.	1.46 (1.004–2.11) <sup>c</sup>
Smoking on non-daily basis is not harmful to health.	1.77 (1.16–2.71) <sup>d</sup>
Very light smoking (1–5 cigarettes per day) is harmless to health.	2.33 (1.32–4.10) <sup>e</sup>
Full smoking ban:	
Hospitals	0.30 (0.16–0.58) <sup>b</sup>
Universities	0.55 (0.41–0.73) <sup>b</sup>
Workplaces	0.67 (0.50–0.88) <sup>f</sup>
Restaurants	0.42 (0.33–0.53) <sup>b</sup>
Coffee shops	0.41 (0.33–0.51) <sup>b</sup>
Nightclubs	0.32 (0.25–0.40) <sup>b</sup>
Bars	0.35 (0.28–0.45) <sup>b</sup>
Analysis according to student status (current student as referent)	
Statement	Odds of agreement (recent graduates) <sup>g</sup> OR (95 % CI)
If a patient has smoked for a long time, it is too late to stop, because their health is already irreversibly affected.	0.30 (0.11–0.78) <sup>h</sup>
Smoking on a non-daily basis is not harmful to health.	0.37 (0.23–0.61) <sup>b</sup>
Regarding smoking cessation, medical advice has little effect on the behavior of patients.	0.43 (0.34–0.55) <sup>b</sup>
Patients already know they should quit smoking. It doesn't make sense to remind them of this.	0.55 (0.31–0.97) <sup>i</sup>
Of the patients who quit smoking, the majority succeed in doing so on their first attempt.	0.72 (0.54–0.94) <sup>j</sup>
It is doctors' responsibility to help their patients quit smoking.	1.57 (1.14–2.17) <sup>k</sup>
Full smoking ban:	
Restaurants	1.44 (1.13–1.84) <sup>e</sup>
Coffee shops	1.33 (1.05–1.67) <sup>j</sup>
Bars	1.31 (1.05–1.64) <sup>l</sup>

<sup>a</sup>Reference: non-smokers (never smokers + former smokers);  
<sup>g</sup>Reference: current students  
 Models adjusted for age, gender, smoking status and student status  
 Significance level indicated as follows: <sup>b</sup>P < 0.001; <sup>c</sup>P = 0.047;  
<sup>d</sup>P = 0.008; <sup>e</sup>P = 0.003; <sup>f</sup>P = 0.004; <sup>h</sup>P = 0.014; <sup>i</sup>P = 0.037; <sup>j</sup>P = 0.017;  
<sup>k</sup>P = 0.006; <sup>l</sup>P = 0.018

for these observations deserve to be further explored, these findings do show a gap in knowledge among health professionals regarding the harm of second-hand smoke that needs to be addressed.

Our study did not find a significant difference in the level of smoking media literacy between current smokers and non-smokers. This result is probably best explained by the fact that almost 90 % of participants had high smoking media literacy, making it very difficult to find any difference between subgroups. The measure may also lose discriminatory power among older, more highly educated respondents such as medical students. Nevertheless, current smokers had a tendency to be less receptive to the notion that tobacco companies disguise



certain messages, as shown in the individual items in which a difference was found.

There are limitations associated with this study. First, the lower response rate may affect the generalizability of the results, although this is consistent with other online surveys,<sup>51–54</sup> and there was no obvious non-response bias, with gender distribution in our sample similar to that found in UBA.<sup>34</sup> Second, the items about tobacco-related attitudes were not possible to use as a scale. Lastly, the cross-sectional design of the study does not allow us to make any causal inference. Nevertheless, our study suggests that, while overall most medical students and recent medical graduates have strong anti-tobacco attitudes, a substantial proportion do not recognize the importance of their role as health professionals in tobacco control strategies. It is disappointing that even though the prevalence of tobacco use has decreased in Argentina, the rate among medical students has not declined at a faster pace. Considering that health professionals should be at the front line of anti-tobacco strategies,<sup>55–57</sup> our findings imply that the opportunity to help smoking patients quit is probably being missed. Since most students reported a need for more training on smoking cessation treatment, increasing the time that UBA's medical school dedicates to tobacco control is desirable. An initial evaluation of the current curricular situation and a survey of the expectations of both students and faculty would guide the changes that are needed. Multimodal training strategies, including role-playing scenarios as well as seeing preceptors as positive role models, may also help in changing attitudes and teaching appropriate cessation treatments.<sup>26, 58</sup> Because physicians continue to be viewed with great respect by the Argentine public, their lack of awareness of this fact may partially explain the high smoking rate in this population, and may project them as negative role models. Medical schools not only need to implement changes in the medical curricula, but also need to develop cessation programs among their students.

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