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Effectiveness of an Intervention to Teach Physicians How to Assist Patients to Quit Smoking in Argentina

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Abstract

Introduction: We evaluated an intervention to teach physicians how to help their smoking patients quit compared to usual care in Argentina.

Methods: Physicians were recruited from six clinical systems and randomized to intervention (didactic curriculum in two 3-hour sessions) or usual care. Smoking patients who saw participating physicians within 30 days of the intervention (index clinical visit) were randomly sampled and interviewed by telephone with follow-up surveys at months 6 and 12 after the index clinical visit. Outcomes were tobacco abstinence (main), quit attempt in the past month, use of medications to quit smoking, and cigarettes per day. Repeated measures on the same participants were accommodated via generalized linear mixed models.

Results: Two hundred fifty-four physicians were randomized; average age 44.5 years, 53% women and 12% smoked. Of 1378 smoking patients surveyed, 81% were women and 45% had more than 12 years of education. At 1 month, most patients (77%) reported daily smoking, 20% smoked some days and 3% had quit. Mean cigarettes smoked per day was 12.9 (*SD* = 8.8) and 49% were ready to quit within the year. Intention-to-treat analyses did not show significant group differences in quit rates at 12 months when assuming outcome response was missing at random (23% vs. 24.1%, *P* = .435). Using missing=smoking imputation rule, quit rates were not different at 12 months (15.6% vs. 16.4% *P* = .729). Motivated smokers were more likely to quit at 6 months (17.7% vs. 9.6%, *P* = .03).

Conclusions: Training in tobacco cessation for physicians did not improve abstinence among their unselected smoking patients.

Introduction

The prevalence of cigarette smoking in Argentina in 2004 was 37.1% among persons between 16 and 65 years,[1] and tobacco consumption

rates among physicians and medical students was similar to the general population.[2] Although half of physicians believed that smoking cessation counseling by clinicians is an effective tool to help patients

quit, less than 30% of physicians and only 5% of medical students had received any training in counseling patients on tobacco cessation.[3]

The role of healthcare professionals in smoking cessation has been the subject of considerable debate.[4] During the late 1980s there was evidence to suggest that advice from physicians to their smoking patients could be effective in facilitating smoking cessation even though the absolute increase in abstinence was small.[5,6] A 2013 Cochrane review analyzed pooled data from 17 trials conducted between 1972 and 1997 of brief advice versus no advice or usual care and detected a significant increase in the rate of quitting with a relative risk of 1.66 (95% confidence interval = 1.42% to 1.94%).[7] Although provision of advice and support to smokers results in only a 1% to 3% absolute increase in cessation rates, this would translate into a substantial public health benefit and be a component in a national tobacco control program.

Despite the clinical evidence in support of smoking cessation counseling, a low proportion of smoking patients report receiving advice on cessation from physicians in high-income countries.[8–11] Advice on smoking is often not offered systematically,[12] in part because 40% of primary care physicians felt that advising smokers about cessation is time-consuming and ineffective,[13] and because many physicians lack the skills for smoking cessation counseling.[14] In addition, most clinicians have difficulty in delivering the recommended "5-As" to most smokers in their care[15,16] and need alternative models to provide or refer to cessation services.[17,18]

We did not identify studies about the provision of smoking cessation assistance by clinicians that were conducted in Latin America or in any low or middle-income country. This study aimed to test if an evidence-based intervention to teach physicians how to help their patients who smoke quit, would result in higher cessation rates compared to usual care in ambulatory clinical settings in Argentina.

Methods

Setting and Clinical Sites

The study was conducted from July 2009 to December 2011 in the City and Province of Buenos Aires, Argentina. General internists, family physicians, and gynecologists were recruited from six clinical systems in the cities of Buenos Aires, La Plata, and Olavarria. The "Hospital Italiano" is a staff model health maintenance organization serving patients with health coverage through their jobs in capitated care at 11 primary care sites. "Centro de Educación Médica e Investigación Clínica" is a health maintenance organization that cares for patients covered through their employment but with fee for service plans. Olavarria is a rural municipality with 31 clinics that provide health care for working class and poor populations. The public health system from the city of La Plata has 26 urban clinics serving mostly poor or uninsured patients. "Hospital Aleman" is a community hospital with a health plan using a fee for service model and "Medicus" is a fee-for-service health plan and both of these systems care for patients from upper middle class background who

purchase this option through their employment or independently. Each of the participant institutions' institutional review board and an NIH certified institutional review board based in Centro de Educación Médica e Investigación Clínica approved the protocol.

Sampling: Physicians

Invitations to participate were sent to physicians who saw more than 100 patients a month in the selected specialties within the 6 systems, 3 months before the study began. Those who agreed to participate signed informed consent and completed a baseline self-administered questionnaire. Physicians were randomized to intervention or usual care within each clinical system, stratified by specialty (general internal medicine/family medicine or gynecology). One year after the intervention, physicians completed a follow-up survey.

Clinician Intervention

The physician intervention consisted of two 3-hour sessions based on the course "Rx for Change: Clinician-Assisted Tobacco Cessation"[19] developed in the United States. The course content was translated to Spanish and adapted to Argentina. The course focused on brief tobacco cessation counseling interventions, including screening, brief counseling (≥3 minutes), and prescribing cessation medications. The theoretical basis of this course was the stages of change model using the 5-As counseling framework and addresses barriers and facilitators in the clinical setting.[20] The instructors taught participants how to use medications as adjuncts to counseling. In addition, physicians received information about how to use the project website www.cmtabaquismo.com.ar with information and materials for clinicians and patients. These included referring patients to the national telephone quit line, access to a self-help booklet,[21,22] and referring patients to a smoking cessation website www.dejardefumar.ucsf.edu.[23] Physicians also received monthly emails as reminders with useful tips to help patients stop smoking or manage withdrawal.

Patient Eligibility and Procedures

Lists of patients seen within 30 days after the study physicians were randomized (control) or had completed the smoking cessation course (intervention) were obtained. Patients were called to ascertain smoking status and confirmed smokers were randomly selected and invited to participate in the study by responding to the surveys. Smokers who had quit after the index clinical visit but before the 1-month survey were included in the study because we considered physicians potentially influenced their smoking cessation. Participants were anchored to this initial index clinical visit when asked what the physician discussed about smoking. This initial survey was the 1-month survey and follow-up surveys were completed 6 and 12 months after randomization of physicians. A smoker was defined as anyone who reported being a daily smoker or nondaily smoker and had smoked during the 30 days prior to the index clinical visit. Figure 1 shows a timeline of the project procedures.

Month	-3 to 0				0	1	2	3	4	5	6	7	8	9	10	11	12
Physicians	Recruitment	Randomization	Completed survey	Training													12-month survey
Patients					Selection of patients*	1-month survey					6-month survey						12-month survey

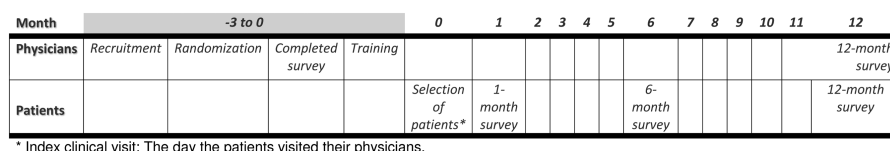* Index clinical visit: The day the patients visited their physicians.

Figure 1. Timeline of the Argentina Physician Intervention Project, 2009–2011. The top part describes the recruitment of participants and below is the timing of this recruitment.

Measures

The 1-month telephone survey asked for age, years of education, self-rated health status, and the two-item depression screen (feeling sad and loss of interest in pleasant activities). Participants were asked about tobacco use history, number of cigarettes smoked per day, nicotine dependence measure defined by time to first cigarette,[24] smoking discussions during the index clinical visit, what steps the physician recommended, receipt of a self-help booklet including information about a website or a follow-up appointment about smoking. Follow-up surveys at 6 and 12 months ascertained smoking status, duration of time without smoking among self-reported quitters, cigarettes per day if still smoking, any use of the previously asked cessation methods, quit attempts in the previous month, and visits to their physician since the last survey.

Physicians responded to a baseline questionnaire about their training, type of practice, smoking history, and years since graduating from medical school. Clinicians were asked to report the quality of tobacco cessation training previously received with responses from very good, good, fair, poor, very poor, or no training received. Items about physicians practice in addressing smoking in the office included asking patients about tobacco use, recording their use in the medical record, counseling smokers to quit, smoking cessation counseling techniques used (reduce number of cigarettes per day, inform of risks of smoking and benefits of quitting, evaluating for motivation to quit), setting a quit date, and use of brochures, referral to a quit line or website, prescribe any indicated medications (nicotine replacement, bupropion, varenicline) and explain withdrawal symptoms. Physicians were also asked to estimate the average amount of time in minutes spent counseling.

Outcomes

The primary outcome measure was point-prevalence abstinence at 6 and 12 months. Secondary outcomes were quit attempts in the past month, use of medications to quit smoking, motivation to quit defined as the proportion of daily smokers who were ready to quit in the next month and those who were ready to quit during the next 12 months, and number of cigarettes smoked per day.

During each survey, patients were asked specific process variables about the index clinical visit at the 1-month survey, the visits over the previous 5 months at the 6-month survey and the visits that had occurred in the previous 6 months at the 12-month survey. Process variable outcomes included patient reports of whether their physician asked about their smoking status, advised them to quit smoking, advised them to reduce the number of cigarettes smoked, set a quit date, gave them a pamphlet about quitting, recommended a website, recommended a guide and whether they agreed to a follow-up appointment to discuss tobacco use in-person or by telephone.

Data Analysis

The longitudinal data had a two-level structure for physician outcomes (physicians, repeated measures within physicians) and a three-level structure for patient outcomes (physicians, patients within physicians, and repeated measures within patients). Intention to treat analyses included generalized linear mixed models with random intercepts that regressed longitudinally assessed binary or continuous outcomes onto X variables describing random group assignment, categorical time of assessment, and the group × time interaction. Primary analyses fit generalized linear mixed models to all available data from all participants and invoked the missing at random assumption. For the 7-day point prevalence outcome only, we additionally fit a generalized linear mixed model under the assumption that missing=smoking. As an adjunct to each model, custom contrasts tested group differences at each assessment. Reported levels of outcome response are model-predicted means or percentages, as appropriate.

Among physicians, we compared the baseline distribution of the demographic variables including age and gender, and years since graduation from medical school between intervention and control groups. We also compared smoking behavior, quality of training in tobacco cessation counseling, type of assistance in tobacco cessation they provide to their patients, and average time during patient visits devoted to tobacco counseling between intervention and control groups, at baseline and at 12 months.

Among patients, we compared demographic variables (gender, age, years of education), perceived health status, depressive symptoms and tobacco use, at the 1-month survey between intervention and control patients, adjusting for clustering of patients within physicians. We also compared main study outcomes (point prevalence abstinence, quit attempt in past month, use of medications to quit smoking, motivation to quit smoking in next month, and in next 12 months, and number of cigarettes per day) and process variable outcomes between intervention and control groups, at the 1-month, 6-month, and 12-month surveys.

Results

Of 620 physicians invited to participate, 254 (41%) agreed and were randomized. The average age was 44.5 years, 52% were women and 181 (71%) were general internists or family physicians. Physicians at the "Hospital Italiano" represented the largest group studied (Table 1).

Physician Outcomes

Baseline

Only 12% of physicians were current smokers and 47% of these were nondaily smokers. A majority had never smoked cigarettes and 36% were former smokers. While 24% of physicians reported no previous training on tobacco cessation at baseline, 41% reported good or very good previous training. At baseline, most clinicians asked their patients about smoking, recorded this in the chart, gave advice about quitting, and informed their patients about the benefit of quitting and the risk of continuing to smoke. A majority associated smoking with patient's current health problems, advised reducing the number of cigarettes per day as a strategy to quit and asked the patients to set a quit date (Table 2). However, at most 10% of physicians used self-help materials or recommended a quit line or website to help their patients quit. About 36% of clinicians discussed withdrawal symptoms, 39% recommended NRT, 45% prescribed bupropion and 19% prescribed varenicline. The mean time reported spent devoted to tobacco counseling was 4.63 minutes (*SD* = 3.67), but only 126 responded.

12 Months

At the end of the study 178 of 254 (70.1%) physicians responded to the 12-month questionnaire, 86 from the control group and 92 from the intervention group; results are shown in Table 2. There was a significant difference at 12 months between groups in the self-reported quality of training in tobacco cessation received, with 44 physicians (51%) in the control group and 84 physicians (91%) in the intervention group reporting very good or good training (*P* < .001). Most counseling

Table 1. Demographic Characteristics of 254 Physicians at Baseline, Argentina, 2009–2011

	Control group N = 130, N (%)[a]	Intervention n = 124, N (%)[a]	Total N = 254, N (%)[a]	P
Institution[b]				
Medicus	14 (10.8)	12 (9.7)	26 (10.2)	.998
Hospital Alemán	12 (9.2)	12 (9.7)	24 (9.5)	
Olavarria Public Clinics	15 (11.5)	15 (12.1)	30 (11.8)	
La Plata Public Clinics	24 (18.5)	24 (19.3)	48 (18.9)	
Hospital Italiano HMO	55 (42.3)	53 (42.7)	108 (42.5)	
CEMIC HMO	10 (7.7)	8 (6.5)	18 (7.1)	
Specialty				
General internal medicine	61 (46.9)	63 (50.8)	124 (48.8)	.822
Family medicine	30 (23.1)	27 (21.8)	57 (22.4)	
Gynecology	39 (30.0)	34 (27.4)	73 (28.7)	
Gender				
Women	66 (50.8)	67 (54.0)	133 (52.4)	.603
Age (y)				
18–34	19 (14.8)	15 (12.2)	34 (13.6)	.491
35–49	76 (59.4)	78 (63.4)	154 (61.3)	
50–64	27 (21.1)	28 (22.8)	55 (21.9)	
≥65	6 (4.7)	2 (1.6)	8 (3.2)	
Age				
Mean years (SD)	44.7 (9.8)	44.3 (9.2)	44.5 (9.5)	.476
Years since graduation from medical school				
Mean years (SD)	18.9 (10.3)	18.3 (9.5)	18.6 (9.9)	.421

CEMIC = Centro de Educación Médica e Investigación Clínica; HMO = health maintenance organization.

[a]Percentages based on non-missing values.

[b]Institutions are listed in order of recruitment.

strategies did not differ between intervention and control groups but intervention physicians were significantly more likely at 12 months to ask their patients to set a quit date, recommend use of self-help brochures, refer to a website or to a telephone quit line for cessation advice (Table 2). There were no group differences in reported use of any cessation medications although there were nonsignificant trends for physicians in the intervention to explain withdrawal symptoms more frequently and to spend more time during the visit devoted to tobacco counseling compared to control physicians.

Patient Outcomes

At the 1-month interview a total of 1378 smoking patients were surveyed; 81% were women, 45% had more than 12 years of education, 81% rated their health status as good or excellent, all had visited their physician at least once, and 63% had access to the Internet (Table 3). All patients reported smoking the month before the telephone call but 43 (3%) patients had quit smoking after the index clinical visit and before the survey was completed. Among respondents who were smoking at the time of the survey, most were daily smokers (1059 or 77%) but 276 (20%) were nondaily smokers only. Among all smokers, 8% stated their doctor did not know they smoked and an additional 9% were uncertain if their doctor knew. About 43% of patients endorsed one of the depression screener questions. At the 1-month interview, the mean number of cigarettes per day reported by daily smokers was 12.9 (SD = 8.8), 41% lit their first cigarette in the first hour after awakening, 23% were ready to quit within the next month while 26% thought they would be ready to quit within the next 12 months (Table 3).

At the 1-month interview, 70% of patients reported that their physicians asked about smoking during the index clinical visit,

66% were advised to quit and 60% were recommended to reduce the number of cigarettes they smoked. Only 17% of participants received a pamphlet (20% intervention and 12% control group), 7% a recommendation to use a web site, 9% a self-help guide and 2% reported setting a quit date (Table 3).

At 6 months, 1107 patients (80%) responded to the follow up survey and at 12 months, 933 (68%). All patients reported at least one visit to their physician in the intervals between surveys at 1, 6, and 12 months. Primary generalized linear mixed models estimated cessation rates in the control group at 6 and 12 months equal to 15.1% and 23.0%, respectively, compared to 17.0% and 24.1% in the intervention group at 6 and 12 months respectively (Table 4). In an analysis where missing data equals smoking, the corresponding cessation rates at 6 and 12 months were 11.9% and 15.6% (P = .406), for the control condition, respectively, compared to 13.6% and 16.4% for the intervention group (P = .729; not shown in table). Among the patients who reported smoking cessation at 12 months, the median days quit was 135 for control participants and 180 for intervention participants The proportions with a serious quit attempt at 6 and 12 months in the control group were 13.8% and 21.4% respectively, and 15.3% and 23.8% in the intervention group. Use of any recommended medications for tobacco cessation was 11% in the control group and 13% in the intervention group at 12 months. The proportion of patients who were motivated to quit smoking in the next month did not differ between intervention and control groups. Similarly, the mean the number of cigarettes smoked per day did not differ by intervention condition (Table 4). None of the group × time interactions for these outcomes were statistically significant.

At the 1-month interview intervention patients were more likely than control patients to report that their physician gave them a

Table 2. Smoking Cessation Counseling Practices by Physicians at Baseline and 12 Months by Intervention or Control Conditions, Argentina, 2009–2011

	Baseline (N = 254)			12 months			
	Control N = 130 (%)	Intervention N = 124 (%)	P	Control N (%)	Intervention N (%)	P	Group × time interaction*
Tobacco use[a]							
Never smoked	65 (50.0)	68 (54.8)	.601	42 (48.8)	50 (54.4)	.401[b]	
Former smoker	51 (39.2)	40 (32.3)		37 (43.0)	30 (32.6)		
Some days	7 (5.4)	6 (4.8)		4 (4.7)	5 (5.4)		
Every day	7 (5.4)	10 (8.1)		3 (3.5)	7 (7.6)		
Tobacco training[a]							
Very good	15 (11.8)	16 (13.1)	.797	15 (17.4)	39 (42.4)	<.001[b]	
Good	39 (30.7)	34 (27.9)		29 (33.7)	45 (48.9)		
Fair	26 (20.5)	30 (24.6)		17 (19.8)	6 (6.5)		
Poor	12 (9.4)	12 (9.8)		5 (5.8)	1 (1.1)		
Very poor	1 (0.8)	3 (2.5)		0	0		
None	34 (26.8)	27 (22.1)		20 (23.3)	1 (1.1)		
Ask patients about tobacco use							
Yes	91.0	89.3	.759	91.9	93.7	.086	0.939
Record patients' tobacco use in medical chart							
Yes	88.1	85.5	.577	93.9	89.7	.730	0.735
Give advice to patient about quitting							
Yes	89.2	89.5	.928	97.7	98.1	.742	0.879
Suggest to patients reducing the number of cigarettes							
Yes	65.2	69.0	.346	69.3	60.4	.680	0.058
Link current smoking with a health problem							
Yes	57.1	58.6	.806	67.5	68.6	.654	0.953
Inform patients about risks of smoking							
Yes	84.5	88.6	.276	92.0	92.1	.895	0.580
Inform patients of the benefits of quitting smoking							
Yes	79.2	82.9	.376	86.5	93.0	.160	0.399
Evaluate patients' motivation to quit							
Yes	61.1	53.0	.269	58.7	67.0	.194	**0.026**
Ask to set a quit date for patients							
Yes	38.4	37.9	.924	39.5	54.0	**.025**	**0.039**
Use self-help cessation brochures							
Yes	7.8	7.5	.909	15.1	36.4	**<.001**	**0.010**
Recommend a smoking cessation website							
Yes	9.3	4.9	.261	7.4	32.9	**<.001**	**<0.001**
Recommend a telephone quit line							
Yes	6.2	3.2	.378	5.6	19.6	**<.001**	**0.009**
Explain withdrawal symptoms							
Yes	42.1	31.2	.188	36.0	44.9	.061	**0.004**
Prescribe medications to help quit smoking							
Yes	18.7	18.0	.275	19.1	29.3	.554	0.088
Recommend/prescribe nicotine replacement therapy							
Yes	42.6	37.7	.698	48.2	58.6	.141	**0.019**
Recommend/prescribe bupropion							
Yes	47.2	50.7	.684	47.1	58.8	.138	0.126
Recommend/prescribe varenicline							
Yes	17.1	18.0	.524	17.4	20.3	.885	0.700
Time in the visit devoted to tobacco cessation counseling							
>3 min	55.0	50.0	.852	60.3	75.2	.095	0.957

[a]Percentages based on non-missing values. All other percentages are model-predicted.

[b]P values from separate chi-square tests, stratified by time of assessment. All other P values were from corresponding generalized linear mixed models.

*P values for group × time interaction are from generalized linear latent and mixed models analysis (GLLAMM) accounting for clustering of observations by physician and repeated measures per patient.

smoking cessation pamphlet (20% vs. 12%, P = .003), but this difference did not persist at 6 or 12 months (Table 4). At 6 months, intervention patients were more likely than controls to report that their physician had asked them to set a quit date (72% vs. 66%, P = .046), but this difference did not persist at 12 months. The group × time interactions for these process variable outcomes that were statistically significant at the 6-month survey did not persist at the 12-month survey, indicating that any observed changes in outcomes over time were similar across intervention and control groups, and therefore, there were no lasting intervention effects.

Table 3. Characteristics of 1378 Smoking Patients at the 1-Month Interview Seen by Study Physicians, Argentina, 2009–2011

	Control group n = 628, n (%)[a]	Intervention group n = 750, n (%)[a]	Total n = 1378, n (%)[a]	P[b]
Institution				
Medicus	71 (11.3)	90 (12.0)	161 (11.7)	.568
Hospital Alemán	85 (13.5)	92 (12.3)	177 (12.8)	
Olavarria	76 (12.1)	61 (8.1)	137 (9.9)	
La Plata	69 (11.0)	170 (22.7)	239 (17.3)	
Hospital Italiano	243 (38.7)	251 (33.4)	494 (35.9)	
CEMIC	84 (13.4)	86 (11.5)	170 (12.3)	
Gender				
Women	504 (80.3)	610 (81.3)	1114 (80.9)	.737
Age				
18–34	154 (26.3)	216 (30.2)	370 (28.5)	.689
35–49	154 (26.3)	182 (24.5)	336 (25.8)	
50–64	175 (29.8)	195 (27.3)	370 (28.5)	
≥65	103 (17.6)	121 (17.0)	224 (17.2)	
Education				
Less than high school	179 (28.9)	228 (30.7)	407 (29.8)	.348
High school	153 (24.7)	196 (26.4)	349 (25.6)	
Some college	172 (27.7)	212 (28.5)	384 (28.2)	
College graduates	116 (18.7)	107 (14.4)	223 (16.4)	
Health status				
Excellent/very good/good	529 (84.2)	592 (78.9)	1121 (81.3)	.058
Fair/bad	99 (15.8)	158 (21.1)	257 (18.7)	
Access to internet				
Yes	407 (65.2)	457 (61.3)	864 (63.1)	.471
Depressive symptoms: sad feelings				
N/A	8 (1.3)	6 (0.8)	14 (1.0)	.425
Yes	260 (41.4)	336 (44.9)	596 (43.3)	
No	360 (57.3)	407 (54.3)	767 (55.7)	
Depressive symptoms: lack of interest				
N/A	14 (2.2)	11 (1.5)	25 (1.8)	.251
Yes	204 (32.5)	273 (36.5)	477 (34.7)	
No	410 (65.3)	463 (62.0)	873 (63.5)	
Does your doctor know you smoke?[c]				
Yes	366 (80.3)	471 (85.3)	837 (83.0)	.182
No	42 (9.2)	34 (6.2)	76 (7.6)	
No answer/unknown	48 (10.5)	47 (8.5)	95 (9.4)	
Tobacco use				
Smoke every day	475 (75.6)	584 (77.9)	1059 (76.9)	.551
Smoke some days	134 (21.4)	142 (18.9)	276 (20.0)	
None (already quit)	19 (3.0)	24 (3.2)	43 (3.1)	
Time to first cigarette (daily only)	n = 475, n (%)[a]	n = 584, n (%)[a]	N = 1059, n (%)[a]	
5 min or less	57 (12.0)	52 (8.9)	109 (10.3)	.334
Between 6–30 min	68 (14.3)	75 (12.8)	143 (13.5)	
Between 31–60 min	80 (16.8)	99 (16.9)	179 (16.9)	
More than 60 min	270 (56.8)	358 (61.3)	628 (59.3)	
Motivation to quit smoking (daily only)	n = 475, n (%)[a]	n = 584, n (%)[a]	N = 1059, n (%)[a]	
Ready in next month	109 (23.0)	131 (22.4)	240 (22.7)	.416
In the next 12 months	117 (24.6)	163 (27.9)	280 (26.4)	
Not motivated to quit	249 (52.4)	290 (49.7)	539 (50.9)	
What did physician recommend?	n = 628, n (%)[a]	n = 750, n (%)[a]	N = 1378, n (%)[a]	
Asked about smoking	413 (65.7)	545 (72.7)	958 (69.5)	.058
Advised to quit	397 (63.2)	517 (68.9)	914 (66.3)	.109
Reduce cigarettes	354 (56.4)	469 (62.5)	823 (59.7)	.108
Set a quit date	13 (2.1)	20 (2.7)	33 (2.4)	.486
Give a pamphlet	78 (12.4)	150 (20.0)	228 (16.6)	**.003**
Recommend website	32 (5.1)	60 (8.0)	92 (6.7)	.087
Recommend a guide	42 (6.7)	75 (10.0)	117 (8.5)	.066
Follow-up appointment	6 (1.2)	7 (1.2)	13 (1.2)	.951
Telephone follow-up	2 (0.4)	4 (0.7)	6 (0.6)	.567
Quit after the visit	19 (3.0)	24 (3.2)	43 (3.1)	.551

CEMIC = Centro de Educación Médica e Investigación Clínica.

[a]Percentages based on non-missing values.

[b]P values account for clustering of observations by physician.

[c]Among current smokers only; this question was added later so there are 370 missing answers.

Table 4. Outcomes in 1378 Patients by Intervention or Control Condition at 1-Month, 6-Month, and 12-Month Surveys, Argentina, 2009–2011 (628 Control and 750 Intervention)

	1-month survey[a]			6-month survey			12-month survey			
	Control %[b]	Intervention %[b]	*P*	Control %[b]	Intervention %[b]	*P*	Control %[b]	Intervention %[b]	*P*	Group × time interaction[c]
Tobacco abstinence	3.1	3.2	.921	15.1	17.0	.285	23.0	24.1	.435	0.894
Quit attempt in past month	7.9	7.1	.744	13.8	15.3	.386	21.4	23.8	.312	0.558
Used medications to quit	5.9	5.8	.848	9.4	9.6	.726	10.9	12.1	.322	0.832
Ready to quit in next month (daily smokers)	23.2	22.9	.833	15.8	17.5	.658	18.1	18.1	.915	0.758
Motivated to quit within 12 months (daily smokers)[d]	47.5	51.1	.370	43.7	50.0	.174	42.2	43.2	.765	0.525
Mean cigarettes/d	13.3	12.7	.212	12.9	12.2	.530	12.3	11.9	.964	0.916
Dr asked about smoking	67.3	72.7	**.004**	74.0	76.6	.155	74.9	81.3	**.037**	0.385
Dr advised to quit	64.8	69.7	**.022**	67.0	73.0	**.016**	70.2	75.9	.136	0.873
Dr advised to reduce number of cigarettes	58.3	63.4	**.018**	63.8	68.9	**.028**	63.3	69.3	.084	0.933
Set a quit date	2.2	2.5	.521	2.7	2.7	.705	4.1	4.4	.373	0.971
Gave a pamphlet	13.1	19.4	**<.001**	18.7	23.8	**.021**	25.2	29.2	.138	0.332
Recommended a website	5.2	7.9	**.048**	6.3	8.0	.328	10.6	11.2	.725	0.415
Recommended a guide	7.1	10.0	**.044**	7.8	10.7	.080	15.1	14.6	.993	0.168
Agreed to in-person follow-up appointment	1.7	1.3	.960	3.4	1.8	.224	1.9	2.8	.209	0.198
Agreed to follow-up appointment by telephone	0.6	0.9	.657	2.4	2.0	.634	0.4	1.3	.258	0.377

[a]1-month survey was completed within 30 days of index clinical visit after physician randomization and intervention.
[b]Tabled Percentages and means are model-predicted values from the corresponding generalized linear mixed model (GLMM).
[c]*P* values for group by time interaction are from GLMM analysis accounting for clustering of observations by physician and repeated measures per patient.
[d]Includes patients who answered they were planning to quit within next month, or within next 12 months.

We also analyzed the outcomes for primary care physicians only excluding gynecologists but there were no differences in abstinence rates at 6 months (13.5% vs. 16.6%, *P* = .23) or 12 months (21.9% vs. 21.6%, *P* = .92) (results not presented in tables). Finally we analyzed the outcomes for the 520 (49%) daily smokers motivated to quit within next 12 months. There was a significant intervention effect on point prevalence abstinence at 6 months (17.7% vs. 9.6% *P* = .027) that did not persist at 12 months (21.5% vs. 22.6%, *P* = .83), and a significant group × time interaction (*P* = .034). A nonsignificantly higher proportion of the intervention group made a serious quit attempt in the previous month at 1-year follow-up compared to the control group (30.1% vs. 21.4%, *P* = .08). There were no significant differences by intervention assignment in cigarettes per day or having used medications to try to quit at either 6 or 12 months.

Discussion

This study showed that providing standardized training in tobacco cessation to primary care physicians practicing in Argentina did not improve the cessation rates among their patients at 6 or 12 months of follow-up. Despite the negative results of our main outcome, physicians participating in the study did perceive that the quality of their training in tobacco cessation improved significantly and they were more likely to report use of evidence-based counseling practices with their patients. Although 40% of respondents in our study reported having received poor quality or no training at all in tobacco

cessation, lack of knowledge did not explain the low commitment of physicians with tobacco cessation interventions.

The 2013 Cochrane systematic review showed that overall patients who were counseled by their clinicians were more likely to quit,[7] but this research has not been conducted in middle-income countries. Studies infrequently described the motivation to quit of randomized participants. In a New York study, only 7% of 518 randomized patients were pre-contemplators, but intervention effects were not statistically significant (12% abstinence vs. 8%).[25] In our study there was a significant effect among motivated daily smokers at 6 months that did not persist. Earlier physician interventions were done at a time when there was little else available to promote smoking cessation and current policy changes facilitating cessation through indoor smoking restriction, increased cost of cigarettes through additional taxes, and alternative available interventions may limit the efficacy of a clinical intervention by strengthening a no-smoking societal norm.

Training clinicians to learn how to counsel patients on behavior change of smoking cessation is by evidence-based standards worthwhile to implement. Training improves general attitudes and approach to tobacco use as a medical problem and may promote staff engagement on this issue. Clinicians may not implement cessation counseling because of barriers and perceived low efficacy of intervention effect on quitting smoking.[26] Clinicians usually do not spend more than 5 minutes on a cessation intervention and one alternative strategy would focus on training to refer to higher efficacy interventions. Studies have shown that training physicians to refer to

cessation-focused specialists or quit lines is effective and this can be complementary to direct smoking cessation counseling.[27]

Nondaily smokers made up nearly 30% of the study participants, as they have become a larger proportion of current smokers. This may be one reason why we did not find significant differences, as interventions in nondaily smokers may need to differ and have not been developed. Contamination from increased counseling among control physicians may also have occurred given that that we randomized physicians to intervention or control within the same health system and may not have avoided their interaction. Intervention physicians did increase practice of four specific cessation techniques and a higher proportion dedicated 3 minutes or more to cessation counseling compared to control physicians. However, all participating physicians were highly motivated to learn smoking cessation expertise and this may have contributed to a null effect.[28]

Another reason that may have led to a null result of the intervention is a possible ceiling effect due to the sample selection of physicians. Half of the participants had received training in tobacco cessation, 70% of them worked in clinical systems that were centers of excellence in health care with academic institutions and some prior experience with smoking cessation programs, and their smoking prevalence was lower than the previously reported rates for Argentine physicians.[2,29] The physicians in our study may have been more motivated and committed to smoking cessation with their patients and might be non-representative of the general population of Argentine physicians.

The intervention may have led to null results because it was based on the trans-theoretical model and there are concerns about the usefulness of this approach.[30] We used the model in large part because it has been the framework used to deliver clinician assisted interventions to promote smoking cessation and many organizations continue to use the framework to implement smoking cessation interventions in health care systems such as in Argentina's National Guidelines for Tobacco Cessation.[31] Finally, we cannot exclude the possibility that the intervention lacked the elements, duration or intensity to produce the desired behavioral changes in physicians. Although participants were motivated to improve their skills in helping their patients quit and we delivered periodic reminders through email, perhaps a more intensive intervention could have had better results. Regardless, using the missing=smoking convention, about 16% of patients exposed to physicians over the year reported abstinence independent of intervention or control.

During the study period in Argentina many cities and provinces have passed laws that protect persons from passive smoking, limited advertising of tobacco products and prohibited the sale of cigarettes to minors. In 2011, the National Law against tobacco was passed but the public discussions took place while the study was being implemented. These social and political changes may have influenced physicians and could explain the increase in some performance indicators in the control group and therefore the lack of effect of the intervention. During the study period Argentina has experienced a dramatic decrease in cigarette smoking rates decreased from 37% in 2004[1] to 22% in 2012.[32]

In conclusion, providing training to primary care physicians and gynecologists did not result in increased abstinence rate among randomly selected smokers at 6 and 12 months. However, about 23.5% of patients reported abstinence at 1 year that is surprisingly high for any type of educational or counseling intervention. The participating physicians also reported an increase in selected cessation methods. It is necessary to explore alternative strategies to change clinician behavior on this important health issue and to incorporate their role in the overall public health goal of promoting smoking cessation.

Declaration of Interests

None declared.

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