

Original investigation

Smoking Patterns and Receipt of Cessation Services Among Pregnant Women in Argentina and Uruguay

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Abstract

Introduction: The 5A's (Ask, Advise, Assess, Assist, and Arrange) strategy, a best-practice approach for cessation counseling, has been widely implemented in high-income countries for pregnant women; however, no studies have evaluated implementation in middle-income countries. The study objectives were to assess smoking patterns and receipt of 5A's among pregnant women in Buenos Aires, Argentina and Montevideo, Uruguay.

Methods: Data were collected through administered questionnaires to women at delivery hospitalizations during October 2011–May 2012. Eligible women attended one of 12 maternity hospitals or 21 associated prenatal care clinics. The questionnaire included demographic data, tobacco use/cessation behaviors, and receipt of the 5A's. Self-reported cessation was verified with saliva cotinine.

Results: Overall, of 3400 pregnant women, 32.8% smoked at the beginning of pregnancy; 11.9% quit upon learning they were pregnant or later during pregnancy, and 20.9% smoked throughout pregnancy. Smoking prevalence varied by country with 16.1% and 26.7% who smoked throughout pregnancy in Argentina and Uruguay, respectively. Among pregnant smokers in Argentina, 23.8% reported that a provider asked them about smoking at more than one prenatal care visit; 18.5% were advised to quit; 5.3% were assessed for readiness to quit, 4.7% were provided assistance, and 0.7% reported follow-up was arranged. In Uruguay, those percentages were 36.3%, 27.9%, 5.4%, 5.6%, and 0.2%, respectively.

Conclusions: Approximately, one in six pregnant women smoked throughout pregnancy in Buenos Aires and one in four in Montevideo. However, a low percentage of smokers received any cessation assistance in both countries. Healthcare providers are not fully implementing the recommended 5A's intervention to help pregnant women quit smoking.

Introduction

Smoking during pregnancy is associated with many adverse outcomes for both the mother and baby including placental complications, intrauterine growth retardation, low birth weight, preterm birth, stillbirth, neonatal death, reduced infant lung function, infant neurodevelopment problems, and sudden infant death syndrome.¹⁻⁴ Smoking is high among women of reproductive age in Argentina (13%–23%) and Uruguay (16%–22%),^{5,6} and prevalence of smoking during pregnancy is estimated to be 11% and 18%, for Argentina and Uruguay, respectively.⁷ However, it is unknown what percentage of women who smoked before pregnancy quit when they learn they are pregnant or later during pregnancy and reasons why women quit in these two countries.

Some women stop smoking spontaneously when they find out they are pregnant.⁷ To support these women and those who cannot quit on their own, clinician counseling is recommended by the World Health Organization,⁸ and has been shown to modestly increase quits and reduce the risk of preterm delivery and low birth weight.⁹ As pregnancy is a time of frequent contact with health professionals, healthcare providers may help to improve maternal and infant health by systematically identifying and providing counseling to pregnant patients who currently or recently used tobacco. The 5A's (Ask, Advise, Assess, Assist, and Arrange) is a best-practice and evidence-based approach for delivering cessation counseling to all smokers.^{9,10} This strategy has been implemented in several countries, including low and middle income countries.¹¹ Since 2011 in Argentina,¹² and since 2009 in Uruguay,¹³ national tobacco control programs have recommended brief cessation counseling interventions based on, or equivalent to, the 5A's; however, training and resources for this approach have not been delivered to healthcare providers at a national level. Thus, it is unknown the extent to which the 5A's for smoking cessation are being implemented by prenatal care providers. The study objectives are to assess smoking patterns and describe receipt of the 5A's for smoking cessation during pregnancy among women attending prenatal care in publicly-funded clinics in Buenos Aires, Argentina and Montevideo, Uruguay. The data from the current study uses baseline data from a cluster randomized-controlled trial of brief counseling to help pregnant women quit smoking. Approximately, 99% of the childbirths in these countries are attended at maternity hospitals; 70% and 50% of childbirths take place in publicly-funded hospitals in Argentina and Uruguay, respectively, which are funded by the ministries of health and free of charge. Prenatal care is provided by physicians and midwives, and over 94% of pregnant women receive prenatal care during at least four visits during pregnancy (a mean of seven visits). Women attending these publicly-funded centers come from the most deprived economic sectors in both countries.^{14,15} These data can be used to inform national tobacco control efforts and prenatal care practices in both countries.

Methods

Data Collection

Our study used baseline data from a cluster randomized-controlled trial prior to implementing a brief smoking cessation counseling intervention. Trial results are not yet available, but detailed methodology is published elsewhere.¹⁶ Prenatal clinics were selected for the main trial if they served more than 250 unique pregnant women per year, did not have a smoking cessation program based on the 5A's for pregnant women, and had physicians, midwives or nurses as part

of their clinic staff. Women were eligible for the current study if they attended one of 21 prenatal clinic clusters and delivered in one of 10 public hospitals in the Province of Buenos Aires, Argentina or one of two hospitals in Montevideo, Uruguay, during October 2011–May 2012. Women with mental or physical impairments that prevented them from being interviewed and women with a diagnosis of stillbirth at admission to the hospital were ineligible to participate.

All consecutively eligible women who signed an informed consent were included until a sample of 100–200 women per cluster was achieved, as required for the main trial.¹³ Interviews were conducted face-to-face within the first 48 hours after delivery and was administered by trained interviewers. Data were collected on paper forms and entered in each country in a secure web data open source management system (OpenClinica).¹⁷

The questionnaire was adapted from a previous study on tobacco use during pregnancy conducted in Argentina, Uruguay and other countries in 2005,⁷ additional questions were added, and questionnaire was pilot-tested again from November 2010 to February 2011. The questionnaire included questions on basic demographics, prenatal care characteristics, tobacco use and cessation behaviors, second-hand smoke exposure, and receipt of cessation counseling during the prenatal care visits.

Data collectors within 12 hours after delivery asked eligible women two questions about their smoking status and women who reported smoking cessation as soon as they found out they were pregnant or later during pregnancy were asked to provide a saliva sample. Biochemical verification was not conducted among women who reported not smoking prior to pregnancy or if they continued to smoke during pregnancy, as the risk of misclassification in these groups are likely low.¹⁸ Women were asked to gently chew on the cotton swab insert from a Salivette (Sarstedt, Newton, NC). The Salivettes were stored in a refrigerator at the hospital for up to 1 month, transferred to a central freezer in each country, and shipped to the US Centers for Disease Control and Prevention laboratory in Atlanta, Georgia, for analysis. Salivary cotinine was measured by high-performance liquid chromatography atmospheric-pressure chemical ionization tandem mass spectrometry.^{19,20} After analysis was completed, the saliva samples were disposed of accordingly.

The study was approved by the ethics committees of all participating hospitals; the Ethics Committee of the Ministry of Health of the Province of Buenos Aires, Argentina; the Ethics Committee of the Centro de Educación Médica e Investigaciones Clínicas “Norberto Quirno”; the Ethics Committee of the School of Medicine, Universidad de la República, Uruguay; and the Tulane University Institutional Review Board, United States.

Variables

Self-reported smoking during pregnancy was determined from questions about the woman's smoking status before and during pregnancy. Women's smoking status was categorized as nonsmokers, spontaneous quitters, late quitters or continued smokers. “Nonsmokers” were those who reported never smoking, tried cigarettes but did not smoke regularly, or quit smoking before they found out that they were pregnant. “Spontaneous quitters” were those who reported quitting as soon as they found out they were pregnant, were abstinent until delivery, and had saliva cotinine ≤ 10 ng/mL. “Late quitters” were those who reported smoking at the time they found out they were pregnant but quit later during pregnancy and remained abstinent until delivery, and had saliva cotinine ≤ 10 ng/mL.²¹ “Continued smokers” were those who reported smoking every day

or some days throughout pregnancy or within the last week prior to delivery. Women who reported quitting during pregnancy, but whose measured cotinine was more than 10 ng/mL were also defined as continued smokers. About 10.0% of women who self-reported smoking cessation during pregnancy had biochemical evidence of continued smoking; detailed results are published elsewhere.²²

All women, including nonsmokers, were asked about receipt of the first two steps of the 5A's: (1) provider screening for tobacco use (Ask) and (2) advice about the harms of tobacco use to themselves or to the unborn infant (Advise). Only quitters (spontaneous and late quitters) and continued smokers were asked about receipt of the remaining three steps of the 5A's: (3) provider assessed their readiness to quit (Assess), (4) woman received assistance from provider (Assist), and (5) provider requested a follow-up contact with woman (Arrange). Assistance could have included advice on how to decrease withdrawal symptoms, help with the process, printed materials, referral to the quitlines,^{12,13} or referral to a health care professional for cessation assistance. For each of the 5A's, women were asked whether it was provided at least one visit, at more than one visit or at all prenatal care visits.

Additional variables derived from the woman's interview were maternal age, citizenship, marital status, highest level of education completed, work status in past year, and trimester of prenatal care initiation. Parity was derived from the clinical record. For spontaneous quitters, late quitters, and continued smokers, we also assessed number of days smoked per week, number of cigarettes smoked per day, quitting attempts, reasons for quitting, smoking initiation prior to pregnancy and intention to use tobacco after the baby was born.

Analysis

Of 3588 eligible women who were invited to participate 4.3% did not provide consent. We excluded three women from the analysis due to missing identification number, 25 due to missing information on smoking status and five due to uncompleted Case Report Forms. The final sample included 3400 women (94.8% of the initial sample); 1863 women (54.8%) gave birth in Argentina and 1537 women (45.2%) in Uruguay. We report frequencies and percentages for categorical variables, and median and interquartile ranges for continuous variables overall and by country. Analyses were conducted using SAS version 9.3.²³

Results

Of 3400 pregnant women, most were 20–34 years old (69.0%), citizens of Argentina or Uruguay (93.32%), married or partnered (80.3%), had completed at least 6 years of schooling (93.4%), unemployed in the past year (76.4%), multiparous (greater than one child; 64.5%), and initiated prenatal care in the first trimester (52.3%). Women who reported continued smoking were more likely to be single, less educated, multiparous, and living with at least one smoker compared to nonsmokers (Table 1).

Sixty-seven percent of the sample did not smoke and overall 32.8% of women were smokers at the beginning of their pregnancy. Of these, 8.3% were spontaneous quitters, 3.6% were late quitters, and 20.9% continued smokers (Table 1). Mean age of smoking initiation was similar in both countries and did not vary by group: 15.5 (3.3), 15.1 (2.6), and 15.1 (3.3) years old for spontaneous quitters, quitters during pregnancy and current smokers, respectively.

Table 1. Main Characteristics of Pregnant Women by Smoking Status

	Nonsmokers, N = 2285 (67.2%)	Spontaneous quitters, N = 282 (8.3%)	Late quitters, N = 122 (3.6%)	Continued smokers, N = 711 (20.9%)	Total, N = 3400 (100.0%)
Age (y)					
≤19	478 (21.1%)	60 (21.6%)	26 (21.5%)	127 (17.9%)	691 (20.5%)
20–34	1536 (67.9%)	198 (71.2%)	89 (73.6%)	500 (70.6%)	2323 (69.0%)
≥35	248 (11.0%)	20 (7.2%)	6 (5.0%)	81 (11.4%)	355 (10.5%)
Country citizenship	2067 (91.1%)	267 (95.0%)	120 (99.2%)	697 (98.4%)	3151 (93.3%)
Marital status					
Married or living with a partner	1860 (82.2%)	220 (78.9%)	93 (76.9%)	531 (75.5%)	2704 (80.3%)
Partner but not living together	110 (4.9%)	13 (4.7%)	8 (6.6%)	38 (5.4%)	169 (5.0%)
Single (divorced, separated, widowed)	294 (13.0%)	46 (16.5%)	20 (16.5%)	134 (19.1%)	494 (14.7%)
Level of education					
Incomplete primary school or less	149 (6.7%)	12 (4.4%)	9 (7.6%)	49 (7.0%)	219 (6.6%)
Complete primary school	584 (26.1%)	76 (27.6%)	27 (22.9%)	246 (35.2%)	933 (28.0%)
Incomplete secondary school	1011 (45.2%)	132 (48.0%)	65 (55.1%)	327 (46.8%)	1535 (46.1%)
Complete secondary school or more	494 (22.1%)	55 (20.0%)	17 (14.4%)	76 (10.9%)	642 (19.3%)
Work status in past year					
Employee	442 (20.0%)	63 (23.5%)	36 (30.0%)	157 (22.6%)	698 (21.2%)
Student	77 (3.5%)	10 (3.7%)	1 (0.8%)	12 (1.7%)	100 (3.0%)
Unemployed	1703 (77.2%)	196 (73.1%)	84 (70.0%)	528 (76.1%)	2511 (76.4%)
Live with at least one smoker	1000 (44.0%)	177 (63.0%)	87 (71.9%)	517 (72.9%)	1781 (52.7%)
Trimester of any prenatal care initiation					
First	1122 (52.4%)	137 (51.3%)	62 (51.7%)	342 (52.3%)	1663 (52.3%)
Second	839 (39.1%)	108 (40.4%)	50 (41.7%)	266 (40.7%)	1263 (39.7%)
Third	181 (8.5%)	22 (8.2%)	8 (6.7%)	46 (7.0%)	257 (8.1%)
Number of prenatal care visits ^a	8 (6–10)	8 (6–10)	8 (6–10)	7 (5–10)	8 (6–10)
Multiparous	1376 (62.6%)	156 (58.7%)	75 (62.5%)	503 (73.0%)	2110 (64.5%)

^aMedian (25th percentile–75th percentile).

Smoking prevalence varied by country, Uruguay had a higher percentage of women who smoked throughout the pregnancy compared to Argentina (26.7% vs. 16.1%; Tables 2 and 3). Overall, five out of 10 women in both countries reported living with at least one smoker. A detailed analysis of secondhand smoke exposure in this population is provided elsewhere.²⁴

Overall in both countries, 80.0% of nonsmokers reported that they were asked about their smoking status, and 36.8% were advised that not smoking was the best thing they could do for their baby in at least one prenatal visit. However, a lower percentage of nonsmokers received the first 2A's at more than one visit (Ask = 24.4%, and Advise = 12.0%) and at all visits (Ask = 13.3%, and Advise = 5.4%; data not shown). Among all quitters, 95.3% were asked their smoking status, 62.9% were advised to quit smoking, 17.8% were assessed of their readiness, 11.9% received assistance to quit and 3.0% received follow-up on their smoking in at least one visit. Lower percentages of quitters received each step of the 5A's at more than one visit and at all prenatal visits (Table 4). Among smokers, 96.2% were asked their smoking status, 74.5% were ever advised to quit smoking, 21.9% were assessed of their readiness to quit, 14.2% received support to quit, and 2.7% were told to return to the clinic to follow up on their smoking ever during prenatal care. When we considered more than one visit, the percentages were 31.0%, 23.9%, 5.3%, 5.2%, and 0.4% respectively. A much lower percentage of smokers received each step of the 5A's at all prenatal visits (Table 5). Since results were different by country, Tables 4 and 5 show the total numbers and the results by smoking status and country.

Among all quitters in both countries, the main reasons for quitting were being worried for the baby's health or because of being pregnant (79.8%), being sick or having nausea (26.0%), and being

worried for their own health (12.0%). In both countries less than 3% of all quitters reported that they quit due to advice from a health care professional, over half of women (53.6%) reported thinking about their baby as the most helpful tool used to quit smoking and 11.5% reported chewing regular gum as a helpful cessation tools (data not shown).

As for women's intention to smoke in the postpartum period, overall 20.6% of smokers reported they were planning to smoke as usual after delivery, 31.1% were planning smoke less than before, 10.5% were not going to smoke and 37.8% were unsure. Among spontaneous quitters, 59% reported that they were not going to smoke and 40% were not sure. Among late quitters, 34% were not going to smoke and 61% were unsure. Since results were different by country, Table 6 shows the total numbers and the results by smoking status and country.

Discussion

Overall, nearly one out of three pregnant women participating in our study reported smoking at the time they got pregnant. This percentage is similar to estimates for women of reproductive ages in other high-income countries²⁵⁻²⁷ and higher than prevalence estimates in other Latin-American countries.^{7,28}

National surveys implemented at each country from 2009 show that 19.8% of nonpregnant women in Uruguay and 22.4% in Argentina smoked.^{6,29} However, results from our study implemented in the capital cities of both counties show that 26.7% and 16.1% of women continued to smoke throughout pregnancy in Uruguay and Argentina, respectively. One difference to note is that our study was conducted in the capital cities, where rates of poverty are high, and

Table 2. Main Characteristics of Pregnant Women by Smoking Status in Argentina

	Nonsmokers, N = 1326 (71.2%)	Spontaneous quitters, N = 174 (9.3%)	Late quitters, N = 63 (3.4%)	Continued smokers, N = 300 (16.1%)	Total, N = 1863 (100.0%)
Age (y)					
≤19	274 (21.0%)	38 (22.4%)	14 (22.6%)	59 (19.8%)	385 (21.0%)
20-34	876 (67.0%)	117 (68.8%)	44 (71.0%)	193 (64.8%)	1230 (66.9%)
≥35	158 (12.1%)	15 (8.8%)	4 (6.5%)	46 (15.4%)	223 (12.1%)
Country citizenship	1122 (85.3%)	161 (93.1%)	61 (98.4%)	288 (96.6%)	1632 (88.3%)
Marital status					
Married or living with a partner	1080 (82.2%)	134 (77.5%)	46 (74.2%)	225 (76.0%)	1485 (80.5%)
Partner but not living together	74 (5.6%)	9 (5.2%)	5 (8.1%)	22 (7.4%)	110 (6.0%)
Single (divorced, separated, widowed)	160 (12.2%)	30 (17.3%)	11 (17.7%)	49 (16.6%)	250 (13.6%)
Level of education					
Incomplete primary school or less	108 (8.4%)	8 (4.8%)	5 (8.5%)	24 (8.2%)	145 (8.0%)
Complete primary school	310 (24.0%)	40 (23.8%)	9 (15.3%)	100 (34.0%)	459 (25.4%)
Incomplete secondary school	442 (34.3%)	70 (41.7%)	29 (49.2%)	107 (36.4%)	648 (35.8%)
Complete secondary school or more	430 (33.3%)	50 (29.8%)	16 (27.1%)	63 (21.4%)	559 (30.9%)
Work status in past year					
Employee	294 (23.4%)	47 (29.0%)	26 (41.9%)	79 (27.7%)	446 (25.3%)
Student	49 (3.9%)	9 (5.6%)	1 (1.6%)	7 (2.5%)	66 (3.7%)
Unemployed	924 (73.7%)	107 (66.0%)	35 (56.5%)	201 (70.5%)	1267 (71.9%)
Live with at least one smoker	605 (46.0%)	112 (64.7%)	47 (75.8%)	222 (74.5%)	986 (53.4%)
Trimester of any prenatal care initiation					
First	519 (42.7%)	71 (44.1%)	30 (47.6%)	129 (46.9%)	749 (43.7%)
Second	546 (44.9%)	75 (46.6%)	27 (42.9%)	122 (44.4%)	770 (44.9%)
Third	151 (12.4%)	15 (9.3%)	6 (9.5%)	24 (8.7%)	196 (11.4%)
Number of prenatal care visits ^a	7 (5-9)	7 (5-10)	8 (5-9)	7 (5-9)	7 (5-9)
Multiparous	808 (64.8%)	101 (63.1%)	42 (67.7%)	206 (73.1%)	1157 (66.1%)

^aMedian (25th percentile-75th percentile).

Table 3. Main Characteristics of Pregnant Women by Smoking Status in Uruguay

	Nonsmokers, N = 959 (62.4%)	Spontaneous quitters, N = 108 (7.0%)	Late quitters, N = 59 (3.8%)	Continued smokers, N = 411 (26.7%)	Total, N = 1537 (100.0%)
Age (y)					
≤19	204 (21.4%)	22 (20.4%)	12 (20.3%)	68 (16.6%)	306 (20.0%)
20–34	660 (69.2%)	81 (75.0%)	45 (76.3%)	307 (74.9%)	1093 (71.4%)
≥35	90 (9.4%)	5 (4.6%)	2 (3.4%)	35 (8.5%)	132 (8.6%)
Country citizenship	945 (99.2%)	106 (98.2%)	59 (100.0%)	409 (99.8%)	1519 (99.3%)
Marital status					
Married or living with a partner	780 (82.1%)	86 (81.1%)	47 (79.7%)	306 (75.2%)	1219 (80.1%)
Partner but not living together	36 (3.8%)	4 (3.8%)	3 (5.1%)	16 (3.9%)	59 (3.9%)
Single (divorced, separated, widowed)	134 (14.1%)	16 (15.1%)	9 (15.3%)	85 (20.9%)	244 (16.0%)
Level of education					
Incomplete primary school or less	41 (4.3%)	4 (3.7%)	4 (6.8%)	25 (6.2%)	74 (4.9%)
Complete primary school	274 (28.9%)	36 (33.6%)	18 (30.5%)	146 (36.1%)	474 (31.2%)
Incomplete secondary school	569 (60.0%)	62 (57.9%)	36 (61.0%)	220 (54.5%)	887 (58.4%)
Complete secondary school or more	64 (6.8%)	5 (4.7%)	1 (1.7%)	13 (3.2%)	83 (5.5%)
Work status in past year					
Employee	148 (15.5%)	16 (15.1%)	10 (17.2%)	78 (19.1%)	252 (16.5%)
Student	28 (2.9%)	1 (0.9%)	0 (0.0%)	5 (1.2%)	34 (2.2%)
Unemployed	779 (81.7%)	89 (84.0%)	49 (84.5%)	327 (80.0%)	1244 (81.5%)
Live with at least one smoker	395 (41.2%)	65 (60.2%)	40 (67.8%)	295 (71.8%)	795 (51.8%)
Trimester of any prenatal care initiation					
First	603 (65.1%)	66 (62.3%)	32 (56.1%)	213 (56.2%)	914 (62.3%)
Second	293 (31.6%)	33 (31.1%)	23 (40.4%)	144 (38.0%)	493 (33.6%)
Third	30 (3.2%)	7 (6.6%)	2 (3.5%)	22 (5.8%)	61 (4.2%)
Number of prenatal care visits ^a	9 (7–11)	9 (7–11)	9 (7–11)	8 (5–10)	9 (6–11)
Multiparous	568 (59.7%)	55 (51.9%)	33 (56.9%)	297 (73.0%)	953 (62.6%)

^aMedian (25th percentile–75th percentile).

may not be representative of the situation in the rest of the nation. It is unclear why the smoking prevalence is higher in Uruguay, despite the country's implementing population-based tobacco control measures since 2004. The difference in smoking prevalence by country was unexpected, and further research is needed to better understand these differences, particularly among low socioeconomic status pregnant women.

In any case these data highlight a serious public health concern and the need to eliminate tobacco use during pregnancy in Argentina and Uruguay. An economic evaluation of data provided in Argentina in 2011 estimated that the direct costs within the health system to attend to illness-related to smoking in the general population was \$2 938 556 523.³⁰ In Argentina and Uruguay, cost estimates for smoking during pregnancy are not currently available in order to motivate health systems to aggressively implement cessation strategies.

We also found that, on average in both countries, most women initiated smoking in adolescence, which suggests that prevention strategies aimed at youth are needed in addition to cessation interventions. Coordinated, multicomponent interventions that combine mass media campaigns, price increases, school-based policies and programs, and smoke-free policies are effective in reducing the initiation, prevalence and intensity of smoking among youth and young adults.³¹

We found that a best-practice approach to help pregnant smokers quit, the 5A's, was not fully implemented in the sample clinics as recommended by country cessation guidelines. As previously mentioned, national guidelines in both countries recommend that providers ask all pregnant women about their smoking status, advise them on the benefits of quitting, and provide assistance and follow-up for those who are ready to quit. While Argentina's guidelines recommend brief cessation counseling at every prenatal visit, Uruguay's

guidelines do not specify the frequency.^{12,13} However, existence of guidelines does not necessarily imply a change in practice training all providers.³² Moreover, at the time of the current study, even if guidelines were published, neither Argentina nor Uruguay had yet conducted broad outreach and training to prenatal care providers. In both countries, low percentages of women reported that they were asked at more than one visit or every visit about their smoking status, and fewer were advised to quit smoking or given help to do so. This is similar to other studies where the first three As are more frequently implemented than the full 5A's.^{33–35} Available resources, even free ones like the quitline,^{12,13} were rarely provided. Some possible explanations could include lack of clinician training on the 5A's, lack of time to conduct the intervention during prenatal care, perceived resistance from women to quitting and concern about potential for harm to the relationship with the patient which has been reported in the formative research of our trial³⁶ and in other studies conducted in high-income countries.^{37–39} A 2005 study of 300 obstetricians-gynecologists in Argentina showed that only 22% received training in smoking cessation counseling and 48.5% reported insufficient knowledge to provide smoking cessation advice.⁴⁰ Similar implementation barriers were reported by midwives in the formative research of this project.⁴¹ Studies show that training on the 5A's as well as training in appropriate communication skills and patient-centered counseling methods such as motivational interviewing can improve smoking cessation.⁴² Thus, providing training, tools and resources on how to effectively implement the 5A's are needed. In addition, healthcare systems changes such as provider reminders and including the 5A's in electronic medical records may help to facilitate delivery of these interventions and integration into routine prenatal care.¹⁰ Moreover, tobacco use among physicians as in both countries

Table 4. Prevalence of the Receipt of 5A's Among Quitters Who Received Prenatal Care in Both Countries

	Argentina (n = 237)			Uruguay (n = 167)			Total (n = 404)		
	At least one visit	At more than one visit	In all prenatal visits	At least one visit	At more than one visit	In all prenatal visits	At least one visit	At more than one visit	In all prenatal visits
Ask									
Did your doctor or other health care provider (HCP) ever ask you if you smoked?	223 (94.5%)	41 (17.4%)	28 (11.9%)	160 (96.4%)	66 (39.8%)	30 (18.1%)	383 (95.3%)	107 (26.6%)	58 (14.4%)
Advise									
Did your doctor or other HCP ever tell you that the best thing you could do for your health / baby's health was to quit smoking?	138 (58.2%)	36 (15.2%)	17 (7.2%)	116 (69.5%)	34 (20.4%)	27 (16.2%)	254 (62.9%)	70 (17.3%)	44 (10.9%)
Assess									
Did your doctor or other HCP ever ask you if you wanted to quit smoking?	52 (21.9%)	16 (6.8%)	6 (2.5%)	20 (12.0%)	5 (3.0%)	1 (0.6%)	72 (17.8%)	21 (5.2%)	7 (1.7%)
Assist									
Did your doctor or other HCP ever tell you about things you could do to quit smoking?	26 (11.0%)	8 (3.4%)	2 (0.8%)	11 (6.6%)	1 (0.6%)	2 (1.2%)	37 (9.2%)	9 (2.2%)	4 (1.0%)
Did your doctor or other HCP ever give you printed materials to help you quit smoking?	19 (8.0%)	7 (3.0%)	2 (0.8%)	4 (2.4%)	1 (0.6%)	1 (0.6%)	23 (5.7%)	8 (2.0%)	3 (0.7%)
Did your doctor or other HCP ever give you the name of someone who could help you quit smoking?	9 (3.8%)	3 (1.3%)	1 (0.4%)	4 (2.4%)	0 (0.0%)	2 (1.2%)	13 (3.2%)	3 (0.7%)	3 (0.7%)
Did your doctor or other HCP ever give you a quitline to call to quit smoking?	9 (3.8%)	2 (0.8%)	1 (0.4%)	4 (2.4%)	1 (0.6%)	1 (0.6%)	13 (3.2%)	3 (0.7%)	2 (0.5%)
Any assist									
Did your doctor or other HCP ever tell you to come back to the clinic just to see how you were doing with your smoking?	33 (13.9%)	13 (5.5%)	3 (1.3%)	15 (9.0%)	3 (1.8%)	3 (1.8%)	48 (11.9%)	16 (4.0%)	6 (1.5%)
Arrange									
Did your doctor or other HCP ever tell you to come back to the clinic just to see how you were doing with your smoking?	10 (4.2%)	3 (1.3%)	1 (0.4%)	2 (1.2%)	2 (1.2%)	0 (0.0%)	12 (3.0%)	5 (1.2%)	1 (0.3%)

Table 5. Prevalence of the Receipt of 5A's Among Smokers Who Received Prenatal Care in Both Countries

	Argentina (n = 300)			Uruguay (n = 411)			Total (n = 711)		
	At least one visit	At more than one visit	In all prenatal visits	At least one visit	At more than one visit	In all prenatal visits	At least one visit	At more than one visit	In all prenatal visits
Ask									
Did your doctor or other health care provider (HCP) ever ask you if you smoked?	276 (92.3%)	71 (23.8%)	40 (13.4%)	406 (99.0%)	149 (36.3%)	133 (32.4%)	682 (96.2%)	220 (31.0%)	173 (24.4%)
Advise									
Did your doctor or other HCP ever tell you that the best thing you could do for your health /baby's health was to quit smoking?	170 (57.1%)	55 (18.5%)	30 (10.1%)	357 (87.3%)	114 (27.9%)	130 (31.8%)	527 (74.5%)	169 (23.9%)	160 (22.6%)
Assess									
Did your doctor or other HCP ever ask you if you wanted to quit smoking?	51 (17.0%)	16 (5.3%)	9 (3.0%)	105 (25.6%)	22 (5.4%)	31 (7.5%)	156 (21.9%)	38 (5.3%)	40 (5.6%)
Assist									
Did your doctor or other HCP ever tell you about things you could do to quit smoking?	28 (9.3%)	12 (4.0%)	3 (1.0%)	49 (12.0%)	16 (3.9%)	5 (1.2%)	77 (10.9%)	28 (4.0%)	8 (1.1%)
Did your doctor or other HCP ever give you printed materials to help you quit smoking?	14 (4.7%)	3 (1.0%)	0 (0.0%)	32 (7.8%)	8 (2.0%)	3 (0.7%)	46 (6.5%)	11 (1.6%)	3 (0.4%)
Did your doctor or other HCP ever give you the name of someone who could help you quit smoking?	13 (4.3%)	3 (1.0%)	1 (0.3%)	14 (3.4%)	5 (1.2%)	2 (0.5%)	27 (3.8%)	8 (1.1%)	3 (0.4%)
Did your doctor or other HCP ever give you a quitline to call to quit smoking?	11 (3.7%)	2 (0.7%)	0 (0.0%)	17 (4.1%)	6 (1.5%)	2 (0.5%)	28 (3.9%)	8 (1.1%)	2 (0.3%)
Arrange									
Any assist	32 (10.7%)	14 (4.7%)	4 (1.3%)	69 (16.8%)	23 (5.6%)	6 (1.5%)	101 (14.2%)	37 (5.2%)	10 (1.4%)
Did your doctor or other HCP ever tell you to come back to the clinic just to see how you were doing with your smoking?	12 (4.0%)	2 (0.7%)	0 (0.0%)	7 (1.7%)	1 (0.2%)	1 (0.2%)	19 (2.7%)	3 (0.4%)	1 (0.1%)

Table 6. Intention of Tobacco Use After Pregnancy Among Smoker and Quitters Women

	Argentina			Uruguay			Total		
	Spontaneous quitters (N = 174)	Quit smoking during pregnancy (N = 63)	Smokers (N = 300)	Spontaneous quitters (N = 108)	Quit smoking during pregnancy (N = 59)	Smokers (N = 411)	Spontaneous quitters (N = 282)	Quit smoking during pregnancy (N = 122)	Smokers (N = 711)
To keep smoking as usual	3 (1.1%)	3 (2.5%)	122 (17.7%)	3 (1.7%)	2 (3.2%)	40 (13.8%)	0 (0.0%)	1 (1.7%)	82 (20.6%)
To smoke less than before	7 (2.5%)	10 (8.2%)	175 (25.4%)	6 (3.5%)	8 (12.7%)	51 (17.6%)	1 (0.9%)	2 (3.4%)	124 (31.1%)
Don't smoke	161 (57.7%)	44 (36.1%)	119 (17.3%)	98 (57.0%)	24 (38.1%)	77 (26.6%)	63 (58.9%)	20 (33.9%)	42 (10.5%)
Not sure/ don't know	108 (38.7%)	65 (53.3%)	272 (39.5%)	65 (37.8%)	29 (46.0%)	121 (41.9%)	43 (40.2%)	36 (61.0%)	151 (37.8%)
Total	279 (100.0%)	122 (100.0%)	688 (100.0%)	172 (100.0%)	63 (100.0%)	289 (100.0%)	107 (100.0%)	59 (100.0%)	399 (100.0%)

their tobacco use is similar to that of the general population, which may hinder cessation guidelines implementation.⁴³⁻⁴⁵

Postpartum relapse to smoking may be of concern, considering 40% of women quit smoking during pregnancy and half of these women were unsure whether they would smoke after delivery. These women are in an advanced stage of change and should be a priority group for effective cessation strategies to prevent relapse and reduce secondhand smoke exposure among infants and children.²⁴ Thus, education and relapse prevention messages (eg, adverse health effects of secondhand smoke exposure to infants and children) are needed, and prenatal intervention may need to be extended into the postpartum period to prevent relapse.

This study is not without limitations. First, receipt of the 5A's was based on retrospective, self-report. However, using responses from women who received the 5A's at more than one visit or all visits account reduce to recall bias. Validation was not possible as smoking cessation counseling was not typically documented in the clinical record in both countries. However, the majority of women maintained a card which documents all their prenatal care and women were allowed to refer to these cards when reflecting on their services. Second, due to limited resources, we relied on self-report to identify smoking status at the beginning of the pregnancy, and we were only able to biochemically verify smoking status of spontaneous and later quitters. However, misclassification of smoking status has been shown to be minimal among women who reported not smoking prior to pregnancy.¹⁸ Finally, these findings may not be generalizable beyond the study participants in these two countries, as the public hospitals and associated prenatal care clinics tend to serve lower-income women compared to private hospitals in these countries.

In conclusion, a substantial percentage of women continued to smoking during pregnancy in Buenos Aires and Montevideo; however, the 5A's is not being fully implemented by prenatal care providers, despite the existence of national recommendations. Efforts are needed to make available training, tools, and resources¹⁰ to encourage dissemination and implementation of the 5A's in prenatal care settings to help pregnant smokers quit smoking and to improve the health of both mother and infant.

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Declaration of Interests

None declared.

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