

Delivery and Impact of a Motivational Intervention for Smoking Cessation: A PROS Study

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abstract

OBJECTIVES: We tested a Public Health Service 5As-based clinician-delivered smoking cessation counseling intervention with adolescent smokers in pediatric primary care practice.

METHODS: We enrolled clinicians from 120 practices and recruited youth (age ≥ 14) from the American Academy of Pediatrics Pediatric Research in Office Settings practice-based research network. Practices were randomly assigned to training in smoking cessation (intervention) or social media counseling (attentional control). Youth recruited during clinical visits completed confidential screening forms. All self-reported smokers and a random sample of nonsmokers were offered enrollment and interviewed by phone at 4 to 6 weeks, 6 months, and 12 months after visits. Measures included adolescents' report of clinicians' delivery of screening and counseling, current tobacco use, and cessation behaviors and intentions. Analysis assessed receipt of screening and counseling, predictors of receiving 5As counseling, and effects of interventions on smoking behaviors and cessation at 6 and 12 months.

RESULTS: Clinicians trained in the 5As intervention delivered more screening ($\beta = 1.0605$, $P < .0001$) and counseling ($\beta = 0.4354$, $P < .0001$). In both arms, clinicians more often screened smokers than nonsmokers. At 6 months, study arm was not significantly associated with successful cessation; however, smokers in the 5As group were more likely to have quit at 12 months. Addicted smokers more often were counseled, regardless of study arm, but were less likely to successfully quit smoking.

CONCLUSIONS: Adolescent smokers whose clinicians were trained in 5As were more likely to receive smoking screening and counseling than controls, but the ability of this intervention to help adolescents quit smoking was limited.



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Deidentified individual data will not be made available.

This trial has been registered at www.clinicaltrials.gov (identifier: NCT01312480).

WHAT'S KNOWN ON THIS SUBJECT: Tobacco use is a significant health issue for adolescents. Pediatricians have an opportunity to screen and counsel youth about smoking. There is limited evidence that brief cessation counseling for adolescent smokers results in cessation attempts or sustained abstinence.

WHAT THIS STUDY ADDS: In a 5As randomized control trial for adolescent smokers, intervention clinicians provided more screening and counseling than those in the control group; adolescents who received interventions more often tried to quit. Nicotine addiction was the strongest predictor of continued smoking.

To cite: Klein JD, Gorzkowski J, Resnick EA, et al. Delivery and Impact of a Motivational Intervention for Smoking Cessation: A PROS Study. *Pediatrics*. 2020;146(4):e20200644

Smoking is the leading cause of preventable death in the United States; 88% of smokers start before age 18.¹ Although occasional and light smoking is common in adolescents,^{1,2} these trajectories lead to addiction.³⁻⁵ Nicotine dependence occurs early^{1,6,7}; the younger an adolescent starts, the more likely they are to smoke as adults.¹ Adolescent smoking cessation is needed to prevent many adolescents from dying of tobacco-related diseases.⁸

Youth identify physicians as preferred information sources regarding smoking^{9,10}; thus, clinician visits are opportunities to address tobacco use. However, this opportunity is often missed because smoking messages in pediatric settings often focus only on screening and abstinence,¹¹⁻¹³ rather than on cessation for young smokers.¹⁴ Few clinicians set quit dates, provide resources, or arrange follow-up for adolescent cessation attempts.^{15,16} Although barriers to preventive service delivery include inadequate education, time constraints, and lack of information about resources,^{15,17} clinician training can increase self-efficacy and delivery of smoking interventions to youth.¹⁸ Counseling interventions promote cessation in adults¹⁹⁻²¹; however, evidence for effectiveness among young smokers is limited.²² The US Public Health Service 5As behavior change counseling model (Ask, Advise, Assess, Assist, Arrange)²²⁻²⁴ was developed from brief smoking cessation counseling studies with adults. Although recommended by consensus guidelines, whether clinician-delivered 5As interventions help adolescent smokers quit is unknown.

In this article, we describe delivery of an adolescent-focused adaptation of the 5As intervention, assess factors associated with youth-reported receipt of the intervention, and describe the impact of the intervention on cessation intentions and smoking behaviors.

METHODS

We conducted a randomized clinical trial of an adolescent-focused adaptation of the Public Health Service 5As smoking screening and brief counseling intervention compared with an attentional control social media counseling intervention in pediatric primary care practices in the American Academy of Pediatrics Pediatric Research in Office Settings (PROS) practice-based research network.²⁵ The study was called “Adolescent Health in Pediatric Practice” (AHIPP) to avoid disclosing the interventions targeted during enrollment. The study was approved by the American Academy of Pediatrics Institutional Review Board (IRB) and 31 local IRBs in participating sites (see Supplemental Information) and registered with ClinicalTrials.gov (NCT01312480).

Adaptation of the 5As

The 5As 1 to 3 minute intervention includes ask about tobacco use; advise against use; assess readiness to quit; assist by providing referrals, adjunct materials, and resources (including pharmacotherapy for adolescents age >18); and arrange follow-up of cessation attempts. We previously described the model and established pilot feasibility of our methods.²⁶ Clinicians were trained to use a 5As checklist to guide clinical encounters.

Practice Enrollment and Participation

We recruited established PROS practices and practices new to PROS.²⁷ Eligible practices self-reported seeing at least 1 adolescent patient per week and estimated smoking rates $\geq 10\%$. Practices were randomly assigned into 2 arms: intervention practice clinicians were trained in 5As, and control clinicians were trained in social media screening and counseling. Each practice was asked to screen all adolescent patients for eligibility and

enroll 100 adolescents into the study. A practice study coordinator monitored recruitment and enrollment procedures.

After initial recruitment and to increase practice enrollment, pediatricians were offered Maintenance of Certification Part IV (MOC) credit for working to improve their practices' screening and enrollment of research subjects.²⁷ Practices received \$150 stipends when they began enrollment and \$150 or \$300 for completing enrollment of 100 or 200 youth, respectively.

Clinician Training

Eligible clinicians included pediatricians, nurse practitioners, and physician assistants. Clinicians completed baseline and follow-up surveys and self-study trainings on the study protocol and intervention. Using methods successful in achieving clinician adherence in other PROS trials²⁸⁻³⁶ and our feasibility pilot,²⁶ clinicians practiced screening and counseling delivery with at least 3 patients and then participated in “teach-back” phone calls, role playing intervention delivery with study staff posing as an adolescent patient to assess fidelity and proficiency. Note that adolescents could choose to enroll or not in a study evaluating their clinician's care delivery and its impact on behavior; they could not choose which intervention (smoking or social media) their clinician had been trained on. Those clinicians successfully delivering interventions during teach-back calls began adolescent enrollment; those who did not received feedback, reviewed training materials, and repeated teach-backs until proficient.

Adolescent Enrollment

Eligible adolescents were age ≥ 14 , seen for well-child or nonurgent sick visits between January 2012 and December 2014. Adolescents (and parents, for those <18) were

consented or assented by the practice coordinator, staff, or clinicians in the practice. Participating adolescents completed a short previsit baseline survey of health behaviors, including smoking. These were sealed at the practice site to ensure confidentiality and sent to the study team weekly. All adolescents who self-identified as smokers at baseline (defined as at least 1 puff of a cigarette or little cigar in the last 30 days) and a random sample of 10% of nonsmokers were contacted by the Survey Research Laboratory at the University of South Carolina for follow-up phone surveys 4 to 6 weeks, 6 months, and 12 months after their clinical visit to assess adolescent-reported smoking and cessation behaviors and clinician delivery of interventions. For each follow-up completed, adolescents smokers received \$20 (\leq \$60 total) and nonsmokers received \$10 (\leq \$30 total).

Measures

Demographics

Clinicians reported on practices (eg, community or academic; solo, group, or clinic; and urban, suburban, or rural), and clinicians and youth self-reported demographics, including age, sex, race, and ethnicity.

Delivery of 5As

In the 4 to 6 week follow-up survey, adolescents were asked to report their clinician's delivery of specific intervention elements during the index visit. Specific questions assessed tobacco screening (Ask and Advise) and counseling (Assess, Assist, and Arrange) (see Fig 1). Scores for 5As "screening" (range 0–6) and, for smokers, "counseling" scores (range 0–4) were calculated by adding 1 point for each item. Scores were averaged over all adolescent visits for each clinician to yield average screening and counseling scores, which were used in regression analyses.

Ask	Advise	Assess	Assist	Arrange
Did clinician: Talk to you about smoking? Ask if you smoked? Ask if your friends smoked? Ask if anyone smoked in your household?	Did clinician: Encourage you not to smoke? Discuss the benefits of not smoking?	Did clinician: Ask if you wanted to quit?	Did clinician: Help you in quitting? Give you resources or materials to help you quit? Tell you about or refer you to Quitlines or other services to help you quit?	Did clinician: Have follow-up appointments to discuss smoking?
Hooked on Nicotine Checklist Measures of Addiction				
Have you ever tried to quit, but could not?				
Do you smoke now because it is really hard to quit?				
Have you ever felt like you were addicted to tobacco?				
Do you ever have strong cravings to smoke?				
Have you ever felt like you really needed a cigarette?				
Is it hard to not smoke in places where you are not supposed to, like school?				
When you tried to stop smoking or when you have not been able to smoke did you find it hard to concentrate because you could not smoke?				
When you tried to stop smoking or when you have not been able to smoke, did you feel a strong need or urge to smoke?				
When you tried to stop smoking or when you haven't been able to smoke, did you feel nervous, restless, or anxious because you could not smoke?				

FIGURE 1

5A Screening and counseling and addiction questions in the AHIPP PROS Study.

Adolescents were also asked about other preventive services counseling, confidentiality, one-on-one time during their visit, and social and environmental risk factors as potential moderator variables.

Adolescent Cessation and Smoking

Smoking status and other tobacco use survey questions included validated measures for lifetime, past-year, and past 30-day use and for addiction using the Hooked on Nicotine Checklist,^{37–41} which measures loss of autonomy over smoking and cravings

(Fig 1). We categorized youth as more or less addicted using odds ratios based on Hooked on Nicotine Checklist compared with mean score at 4 to 6 weeks. Youth were also asked about quit behaviors including number of attempts, attitudes toward smoking and cessation, and changes in smoking before or after visits with their clinician.

Analysis

Demographic characteristics were assessed at baseline for adolescents and clinicians, respectively.

Differences were examined by using χ^2 tests for proportions and *t* tests for continuous measures. Screening and brief counseling between study arms was examined by using mixed models accounting for the correlation between measures from the same practice. Logistic regression models were fit to assess the effect of the 5As intervention on youth smoking behavior and cessation intentions and identify potential factors associated with these outcomes at 6- and 12-month follow-up, adjusting for youth and practice-level demographics. Model fit and diagnostics were conducted to ensure the validity of inference. Factors associated with loss-to-follow-up were also investigated by using multivariable logistic regression. Data were analyzed by using SAS 9.4 (SAS Institute Inc, Cary, NC).

RESULTS

A total of 120 PROS practices enrolled in the study: 9% solo, 53% group, 10% medical school, 7% hospital based, and 21% other. Almost half (46%) were suburban, 19% rural, 19% urban noninner city, and 16% urban inner city. Overall, 249 clinicians participated: 88% pediatricians and 12% nurse practitioners or physician assistants. Pediatricians who enrolled seeking MOC credit were not different from those who did not with regard to age, ethnicity, and patient care hours but were more likely to be female ($P < .005$) and to identify as other than white ethnicity ($P < .05$).²⁷

Practices enrolled 10 967 adolescents in the study (range = 2–208; mean = 105; median = 100). Of these, 936 (8.5%) self-identified as smokers at enrollment. All current smokers plus ~10% of nonsmokers (total $n = 1937$) were selected for follow-up. Of these, 1317 completed 4 to 6 week surveys, 992 completed 6-month surveys, and 682 completed 12-month surveys (Fig 2). Adolescent and clinician

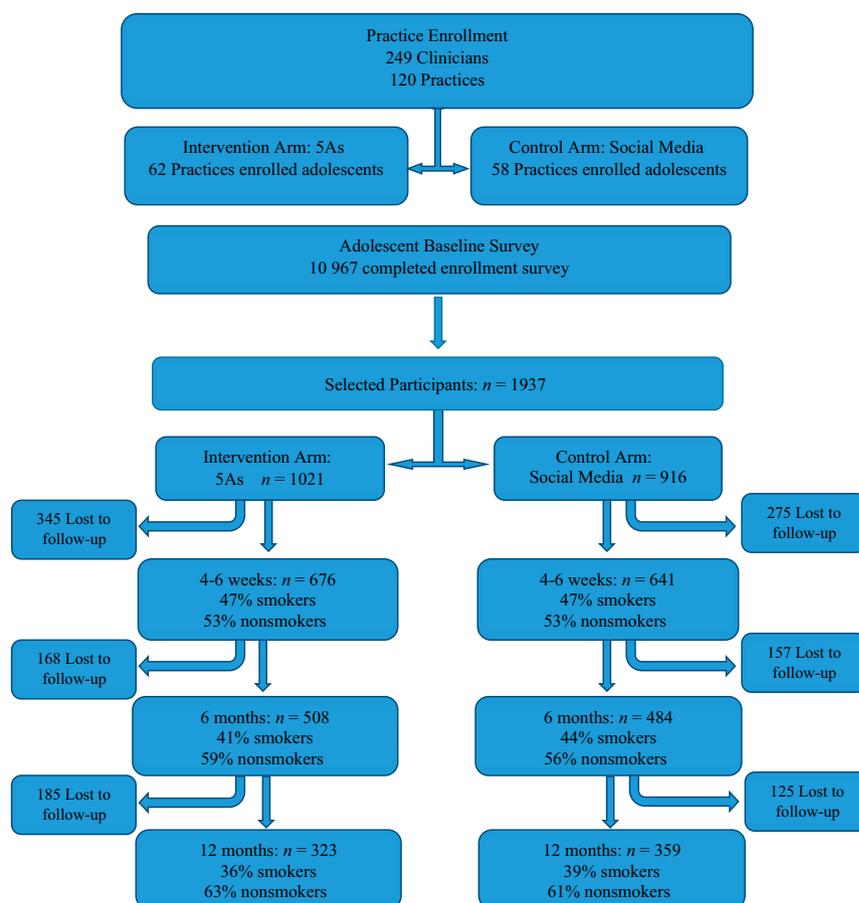


FIGURE 2 Practice randomization and adolescent enrollment in the AHIPP Study (consort flowchart).

demographics did not differ between study arms (Table 1).

Logistic regression controlling for adolescent demographics, smoking

status, pediatrician MOC participation, and study arm assignment showed that adolescents who were higher socioeconomic status (SES), non-Hispanic, and better

TABLE 1 Demographics for Adolescents and Clinicians Participating in the AHIPP Study

	Intervention Arm: 5As	Control Arm: Social Media
Adolescents		
Age, mean (SD); median, y	16.7 (2.05); 17	16.5 (1.94); 16
White, %	75.6	76.6
Female, %	62.4	57.7
High SES, %	54.6	54.5
Hispanic, %	11.0	13.2
Gets good grades, % ^a	47.2	49.4
Clinicians		
Age, mean (SD); median, y	46.9 (10.43); 48	46.5 (10.93); 46
White, %	75.9	83.3
Female, %	73.7	68.7
Hispanic, %	8.3	3.5
Hours of patient care per week, mean (SD); median	40.0 (18.37); 40	37.4 (14.46); 38

^a Based on self-report of “above average” or “honor student” in response to: “What type of grades do you get in school?” or “What type of grades did you get when you were in school?”

students were more often lost to follow-up at 6 months (all $P < .05$). At 12 months, adolescents who were older, lower SES, and in the 5As intervention arm were more often lost to follow-up (all $P < .05$). Neither clinician seeking MOC credit nor patient smoking status at enrollment were related to follow-up participation. No harms were reported by participants from either study arm.

Baseline Quitting Behaviors

Among smokers who completed baseline surveys, 51% reported having seriously tried to quit in the past year: 42% motivated by wanting to improve health and 9% motivated because of cost. Most (86%) reported trying to quit without support, 3% used nicotine gum or patches, and 9% used electronic cigarettes (e-cigarettes). None reported using quitlines, relaxation or hypnosis, or quit Web sites, and only one adolescent reported using prescription drugs. Baseline quitting behaviors (assessed by self-reported endorsement of all that applied from a list of common response items with an option to add “other” reasons for their choices) did not vary significantly between study arms.

Training in 5As and Screening and Counseling Scores

Clinicians trained in 5As interventions were more likely to deliver smoking screening ($\beta = 1.0605, P < .0001$) and counseling ($\beta = .4354, P < .0001$). These clinicians provided significantly more smoking screening (average score, 3.89 vs 2.79; $P < .001$) and counseling (average score, 0.73 vs 0.29; $P < .001$) than those in the control arm (Table 2).

Clinician Training and Youth Receipt of 5As

Adolescents whose clinicians were trained in the 5As intervention were more likely to report having been

TABLE 2 Frequency of Clinician-Delivered Smoking Screening and Counseling by Study Arm and Adolescent Baseline Smoking Status

	Intervention Arm: 5As		Control Arm: Social Media	
	Percentage of Nonsmokers ^a	Percentage of Smokers	Percentage of Nonsmokers	Percentage of Smokers
“Ask” ^b	67.3	83.3	53.5	65.9
Clinician talked to you about smoking	67.3	83.3	53.5	65.9
Clinician asked if you smoked	63.9	78.5	48.3	59.3
Clinician asked if friends smoked	41.0	44.6	29.3	34.5
Clinician asked if others at home smoke	45.3	57.0	31.4	42.1
“Advise” ^c	62.8	81.1	50.2	64.5
Clinician encouraged you not to smoke	62.2	79.8	48.3	63.8
Clinician discussed benefits of not smoking	50.4	72.1	40.2	54.1
“Assess”: clinician asked if you wanted to quit	n/a	48.7	n/a	30.3
“Assist”	n/a	44.2	n/a	22.1
Clinician tried to help you quit	n/a	43.9	n/a	21.7
Clinician gave something to help quit	n/a	21.2	n/a	4.5
Clinician told you about services to help quit	n/a	27.9	n/a	12.1
Screening score mean (SD); median (range) ^d	3.7 (1.44); 4 (0–6)	3.7 (1.44); 4 (0–6)	2.8 (1.58); 3 (0–6)	2.8 (1.58); 3 (0–6)
Counseling score mean (SD); median (range) ^d	0.7 (0.86); 0 (0–4)	0.7 (0.86); 0 (0–4)	0.3 (0.51); 0 (0–4)	0.3 (0.51); 0 (0–4)

n/a, not applicable.

^a Nonsmokers by self-report of not having smoked in the 30 d before the survey.

^b Significant differences in Ask between nonsmokers and smokers (in intervention arm, difference between nonsmokers and smokers $P < .001$; in control arm, difference between nonsmokers and smokers $P = .002$).

^c Significant differences in Advise between nonsmokers and smokers (difference between nonsmokers and smokers $P < .001$).

^d Significant differences in screening and counseling scores between study arms ($P < .001$).

screened for smoking compared with adolescents seen by clinicians in the control arm: their clinicians were more likely to ask if they smoked (71% vs 53%), if friends smoked (43% vs 31%), and if anyone at home smoked (51% vs 36%) (all $P < .0001$). These youth were also more likely to be encouraged to avoid smoking (70% vs 55%) and told about the benefits of not smoking (60% vs 46%) (all $P < .0001$).

Compared with the control arm, adolescent smokers whose clinicians

were trained in the 5As were also more likely to report that their clinician assessed their readiness to quit (64% vs 42%), tried to help them quit (57% vs 30%), provided resources to help them quit (28% vs 6%), and talked about services that could help them quit (38% vs 15%) (all $P < .0001$). Only one adolescent in the 5As arm and no adolescents in the control arm had follow-up visits to discuss smoking. In both study arms, clinicians delivered more tobacco screening to adolescent smokers than to nonsmokers ($P < .005$) (Table 2).

In multivariable logistic regressions, clinician training in the 5As was the strongest predictor of whether youth reported being screened for tobacco use (adjusted odds ratio [aOR] = 3.44, 95% confidence interval [CI] = 2.37–5.02). Other predictors included youth reporting having ever tried smoking (aOR = 3.37, 95% CI = 2.40–4.75) and clinicians delivering more screening for other preventive care topics during visits (aOR = 1.30, 95% CI = 1.26–1.35). Among adolescent smokers, clinician training in the 5As was a predictor of youth receiving cessation counseling and support (aOR = 2.21, 95% CI = 1.40–3.48). Other predictors of whether smokers were counseled included youth report of having had a discussion about confidentiality (aOR = 4.40, 95% CI = 1.82–10.65), having had a one-on-one private conversation with their clinician (aOR = 1.69, 95% CI = 1.01–2.84), youth-reported addiction to nicotine (aOR = 1.52, 95% CI = 1.41–1.64), and youth report of clinicians delivering more preventive care on other topics (aOR = 1.11, 95% CI = 1.08–1.15).

Smoking Behaviors and Intentions at 6 Months

At 6-month follow-up, more youth in the 5As arm reported having made quit attempts than in the control arm (64% vs 46%, $P < .05$); however, study arm was not significantly associated with successful quitting. More youth in the 5As arm reported receiving screening and counseling than those in the control arm (72% vs 49%, $P < .0001$); however, receipt of screening and counseling, regardless of study arm, did not affect reported motivation to quit. In fact, those who received counseling during clinical visits (regardless of study arm) were more likely to have smoked in the previous 30-days (20% vs 34%, $P < .01$) than those who had not received any interventions. Quit attempts and sustained quitting rates are shown in Table 3.

TABLE 3 Attempt to Quit and Sustained Quitting by Study Group

	Intervention Arm: 5As, % of Smokers	Control Arm: Social Media, % of Smokers
6 mo		
Attempted to quit ^a	30	20
Successfully quit ^b	57	54
12 mo		
Attempted to quit ^a	21	53
Successfully quit ^b	46	20

^a Based on answering “yes” to “Would you say that you are trying to quit smoking?”

^b Based on reporting having smoked 0 cigarettes in the 30 d before completing the survey.

In logistic regression models controlling for study arm assignment and demographics, receipt of counseling, addiction, and clinician behaviors (including provision of preventive services and private time), the only predictors of successful quitting were a lower addiction score (aOR = 0.80, 95% CI = 0.71–0.90) and younger age (aOR = 0.80, 95% CI = 0.66–0.97). None of these factors predicted an adolescent’s quit attempts. The strongest predictor of wanting to quit was reported receipt of clinician counseling (aOR = 2.50, 95% CI = 1.23–5.07). Those who reported having private time with their clinician were less likely to want to quit smoking (aOR = 0.40, 95% CI = 0.16–0.99).

Smoking Behavior and Intentions at 12 Months

At the 12-month follow-up, bivariate analyses revealed that study arm was not significantly associated with quit attempts or quitting among adolescents. More adolescents in the 5As arm reported receiving screening and counseling than those in the control arm (71% vs 45%, $P < .001$). Those who received screening and counseling (regardless of study arm) were more motivated to quit than those who had not received counseling or screening, but this finding was not significant (77% vs 63%, $P < .06$). As was seen at 6 months, adolescents who received counseling during their clinical visit (regardless of study arm) were more likely to have smoked in the previous 30-days at 12 months (25% vs 41%,

$P < .05$). Rates of quit attempts and sustained quitting at 12 months are shown in Table 3.

In logistic regression models, adolescents whose clinicians were in the 5As arm (aOR = 2.53, 95% CI = 1.04–6.18) or were female (aOR = 3.16, 95% CI = 1.36–7.33) were more likely to quit, whereas those who were more addicted were less likely to quit (aOR = 0.85, 95% CI = 0.74–0.98). No factors predicted quit attempts. Female adolescents were also more likely to want to quit (aOR = 2.78, 95% CI = 1.22–6.33).

CONCLUSIONS

This randomized controlled trial of a 5As intervention to decrease adolescent smoking found pediatric clinician training improved delivery of smoking cessation screening and counseling to adolescent patients. Adolescent smokers whose clinicians had been trained in the 5As made more quit attempts after a routine clinical encounter than those in a control arm; they were also more likely to have quit at 12 months, although no effect on quitting was seen at our 6 month measurement. As in previous work,^{42,43} adolescent smokers and those with higher addiction scores were less likely to quit, regardless of their clinicians’ study arm assignment or actual delivery of cessation counseling interventions. Adolescent smoking is correlated with increased likelihood of smoking into adulthood, and youth are highly susceptible to nicotine

addiction.^{1,6,7} Our finding that greater addiction predicted future smoking is consistent with this and suggests that future interventions may need to directly address stronger addiction.

Most adolescents who tried to quit did so with little support. Although youth who received care in intervention practices were more likely to have gotten assistance from clinicians, few used nicotine replacement or other pharmacotherapy, and none used quitline⁴⁴ or web-based resources, even though these can successfully aid quitting among adults.⁴⁵⁻⁴⁷ Ten percent reported using e-cigarettes to try to quit. This study occurred early in the e-cigarette epidemic and before Juul's dominance of the youth market; however, evidence suggests youth are often more addicted to nicotine and less likely to quit smoking conventional cigarettes if they use e-cigarettes.^{48,49}

Half of youth in our study who relapsed from a quit attempt reported stress as a reason for relapse, suggesting stress reduction could be employed to support quit attempts. Stress has increased among adolescents.⁵⁰ This aligns with previous research showing that cravings and stress are reported frequently by adolescents who made recent quit attempts.⁵¹ Thus, adjuncts to cessation interventions that address stress reduction and addiction may be a potential focus for future studies.

The association between youth-reported receipt of private time with clinicians and continued smoking suggests that clinicians may deliver additional counseling to adolescents they perceived as having engaged in risky behavior. This is consistent with recent work showing an association between private time and other high-

risk behaviors, suggesting that clinicians may deliver more intense preventive care interventions when aware of the need for this care.⁵²

Our study is limited in that clinicians in the PROS network may not reflect all practicing pediatricians, although researchers in previous PROS studies have demonstrated that sampled patients approximate the US noninstitutionalized child and adolescent population.²⁸⁻³⁶

Additionally, we were not able to enroll adolescents whose parents were not available for consent, although we had shown no difference in smoking rates between youth able to enroll confidentially, without parent consent, in our feasibility pilot.²⁶ Although our pilot study found equal retention of smokers and nonsmokers using the same protocol, we also experienced significant differential loss of smokers compared with nonsmokers between baseline enrollment and follow-up surveys.

Although this bias is unlikely to have lost smokers who were more likely to quit, the differential retention further emphasizes the need for strong initial engagement, multiple contact modalities, and reinforcement of interventions for youth who smoke. Furthermore, we showed no difference in attrition between youth whose pediatricians received MOC credit compared with those who did not. These pediatricians were more likely to work in underserved areas,²⁷ and their inclusion and retention of patients for this study may have yielded a more diverse patient population for the intervention. The study is also limited in that we did not include a robust question about the fifth A (arrange follow-up) besides asking about additional visits. Thus, we cannot fully assess the delivery of this "A."

Despite limitations, our study demonstrates that pediatric clinicians can deliver 5As interventions to youth smokers, resulting in more quit attempts, and, in some cases, abstinence. A recent US Preventive Services Task Force report found insufficient data for the effectiveness of adolescent cessation counseling.⁵³ Although the ability of this brief 5As intervention to help adolescents quit and remain abstinent was limited, the intervention is scalable, and planned clinical follow-up with repeated counseling interventions and attempts (as is generally the case for successful adult quitters⁵⁴) and with additional cessation resources, has the potential to eventually improve quit rates. To achieve a tobacco-free generation, public health efforts should continue to address both public policies and effective prevention counseling to prevent nicotine addiction and delay smoking initiation.

ACKNOWLEDGMENTS

We thank Drs Alexander Fiks, Laura Shone, and Margaret Wright for their careful reviews of earlier versions of this article, and the clinicians, practice staff, parents, and adolescents who participated in this study.

ABBREVIATIONS

AHIPP: Adolescent Health in Pediatric Practice
aOR: adjusted odds ratio
CI: confidence interval
e-cigarette: electronic cigarette
IRB: Institutional Review Board
MOC: Maintenance of Certification Part IV
PROS: Pediatric Research in Office Settings
SES: socioeconomic status

DOI: <https://doi.org/10.1542/peds.2020-0644>

Accepted for publication Jul 10, 2020

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PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

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FINANCIAL DISCLOSURE: The authors have indicated they have no financial relationships relevant to this article to disclose.

FUNDING: Supported by National Institutes of Health, National Cancer Institute grant R01-CA140576 and by a grant from the Flight Attendant Medical Research Institute to the American Academy of Pediatrics Julius B. Richmond Center of Excellence. Additional infrastructure funding was provided by the American Academy of Pediatrics and the Health Resources and Services Administration of the US Department of Health and Human Services under *UA6MC15585*: MCH Research Network Programs. The information, content and/or conclusions are those of the author(s) and should not be construed as the official position or policy of, nor should any endorsements be inferred by Health Resources and Services Administration, Health and Human Services, or the US Government. Funded by the National Institutes of Health (NIH).

POTENTIAL CONFLICT OF INTEREST: The authors have indicated they have no potential conflicts of interest to disclose.

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