Original investigation

The Difference a Decade Makes: Smoking Cessation Counseling and Screening at Pediatric Visits

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Abstract

Introduction: There has been a sharp decline in adolescents who smoke cigarettes but no national-level study evaluating the impact of smoking cessation counseling by pediatricians or other clinicians who care for children.

Methods: Combined data from ambulatory portions of the National Hospital Ambulatory Care Survey and National Ambulatory Medical Care Survey from 1997–1999 and 2009–2011 were analyzed to determine changes in the frequency of pediatric visits that included clinician-reported tobacco counseling and how such counseling varied by child, family, and clinician characteristics.

Results: In 1997–1999, 1.5% of all medical visits for children aged below 19 years included tobacco counseling; this increased to 3.8% in 2009–2011 ($P < .001$). A marked increase from 4.1% to 11.1% was noted at well-child visits ($P < .001$). There were significant increases in counseling by pediatricians but not mid-level providers or general/family physicians. Provision of counseling did not result in greater visit length during either time point. During 2009–2011, visits with a diagnosis of asthma were four times as likely (OR 4.2, 95% CI 2.8–6.2) and visits for otitis media two times as likely (OR 2.1, 95% CI 1.2–3.7) to include smoking cessation counseling than sick visits for all other diagnoses.

Conclusion: These results demonstrate a significant increase in tobacco counseling by pediatric providers within the last decade, especially at well-child visits. However, the American Academy of Pediatrics' recommendation that pediatricians counsel about the harms of tobacco use and secondhand smoke exposure has not yet been exhaustively implemented.

Implications: A significant increase in smoking cessation counseling at pediatric medical appointments, especially at well-child visits, occurred from 2009–2011 compared with 1997–1999, paralleling a large decrease in smoking prevalence. These improvements in counseling rates have been predominantly noted for pediatricians but not mid-level providers or general practitioners. Counseling was not associated with increased visit lengths. Although improved counseling practices by pediatricians have been demonstrated, there is still room for improvement.

Introduction

According to the Surgeon General, 126 million US residents are exposed to secondhand smoke (SHS), 22% of whom are children under 18 years.¹ An additional 10%–15% of children are exposed to prenatal smoke.^{2,3} Although many smokers are aware of the harmful consequences of tobacco smoke to themselves and their families, they continue to smoke. There is no safe level or duration of SHS in children. Despite this, children are not only more likely to be exposed but also more susceptible to the effects of SHS than adults.^{4–6} Both prenatal and postnatal SHS exposure in children is associated with sudden infant death syndrome, otitis media (OM), asthma, cardiovascular effects, behavioral problems, respiratory problems, and increased cancer risk.^{1,7–16} Furthermore, childhood SHS exposure is associated with increased risk of tobacco initiation^{17–19} and symptoms of addiction in children who have never smoked.²⁰ There has been a sharp decline in high school students who smoke cigarettes; among 12th-grade students, 30-day prevalence rates have declined from 37% in 1997 to 14% in 2014.²¹

There are many reasons for this decline in smoking rates. Some well-explored causes include increases in cigarette prices, restriction on marketing, mass media campaigns, and increases in knowledge of the harms of cigarettes, among others.²² The role of the pediatric clinician in influencing these rates is not clearly defined on a population basis. Clinician screening and counseling for smoking cessation have been shown to increase smoking cessation among various groups of people.^{23–26} The American Academy of Pediatrics²⁷ and the World Health Organization,²⁸ as well as other organizations, have made recommendations to encourage clinician screening and counseling for smoking cessation. A recent US study assessing tobacco screening and assistance among 11- to 21-year olds at physician office visits found that clinicians screened for tobacco use at 74.2% of visits in 2010 (up from 71.5% in 2004), and 19.8% of individuals who screened positive for smoking received cessation assistance, including counseling, prescriptions.²⁹

Given this information, there is reason to believe that one important driver of reduced smoking rates, including among women of childbearing age, is a potential increase in clinician counseling practices. It is known that in regard to adults, psychiatrists have almost doubled tobacco cessation counseling from 1993–1996 to 2006–2010.³⁰ Previously, one of the investigators of this study (MW) showed that in 1997–1999, clinicians counseled parents at remarkably low levels—only 1.5% of all visits included cessation counseling.³¹ These low levels held true across appointment type, regardless of whether the visit was a well-child appointment or an appointment with regard to illnesses known to be impacted by exposure to SHS.³¹

Using the National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS), we set out to examine how clinician tobacco counseling rates have changed from the 1997–1999 period to 2009–2011. We also examined how visit time is impacted by counseling. As new variables have been added to the dataset, we include additional analyses examining tobacco screening practices for 2009–2011.

Methods

The data analyzed in this study were obtained from the NAMCS and NHAMCS. The NAMCS is a national survey based on a sample of visits to nonfederal office-based physicians engaged in direct patient care. Each physician participating in the survey is randomly

assigned a 1-week reporting period during which a variety of data are obtained, including patients' demographic characteristics and symptoms, physicians' diagnoses, medications ordered, services provided, and planned future treatments. It has been conducted annually since 1989. The NHAMCS is designed to collect data on the provision of ambulatory care services in hospital emergency and outpatient departments. The survey instrument used is the Patient Record form, with three versions—one for the emergency department, one for outpatient departments, and one for ambulatory surgery facilities. An assortment of data is collected, including many of the same variables in the NAMCS. A full description of the data collected and methodology are available from the Centers for Disease Control and Prevention.³²

Data were combined from the NAMCS and the outpatient portion of the NHAMCS. To be included in the analyses, patients had to be less than 19 years of age and had to be seen by either a physician, nurse practitioner, or physician's assistant. Data were combined for two time periods, 1997–1999 and 2009–2011. Similar types of office-based clinicians were sampled for the 1997–1999 and 2009–2011 samples of the NAMCS, although for the 2009–2011 time-frame, physicians and nonphysician practitioners were also included from an additional sampling frame of community health centers.

The variables examined were child age (categorized as 0–1, 2–4, 5–12, and 13–18 years), race, ethnicity, insurance status and visit diagnosis, clinician type (physician or nurse practitioner/physician's assistant), physician specialty (pediatrician, general/family physician, or other), time spent with physician, problem type (acute, routine chronic, flare of a chronic problem, surgical, or preventative), whether tobacco counseling was provided, and whether tobacco use was documented (2009–2011 time period only). For both time periods, counseling was documented by the medical provider checking a box for whichever health education/counseling services he/she provided, which can include "alcohol abuse counseling," "tobacco use/exposure," "weight reduction," and others. No further information is given about the length of the counseling provided or whether it was provided to the patient or parents. There is no further validation beyond physician self-report for the provision of counseling. Tobacco use is documented simply as "not current," "current," or "unknown." Neither survey distinguishes primary care physicians from subspecialists. Visit diagnosis was coded by International Classification of Diseases-9 code: asthma (493), OM (381, 382), and well-child (V20, V70). The National Center for Health Statistics (NCHS) provides imputed data for variables with high rates of missing data (race and ethnicity)—these estimates are used in our analyses.

All percentages in this study are weighted to reflect national estimates—a total of 71 224 individual observations were weighted. Independent predictors of tobacco counseling were determined with weighted logistic regression. Comparison of means was performed with the adjusted Wald test. Analyses were carried out using Stata Statistical Software (Release 13; StataCorp LP, College Station, TX).

Results

From 1997 to 1999, 1.5% of medical visits for children less than 19 years of age included tobacco counseling—this increased to 3.8% of visits between 2009 and 2011 ($P < .001$, Table 1). Statistically significant increases across timepoints were seen by each age-group up to 12 years, for white but not black children and for both Hispanic and non-Hispanic children. Children were substantially more likely to receive counseling at well-child visits in the most recent time

period (11.1%) than in earlier years (4.1%, $P < .001$). In the 1997–1999 time period, visits at which children were seen by a physician were less likely to include tobacco counseling (1.5%) than visits with a nurse practitioner or physician's assistant (4.1%). In contrast, in 2009–2011, physicians and nurse practitioners/physician's assistant provided counseling at 3.8%. A significant increase from 1.6% to 5.1% ($P < .001$) was seen over time for visits that took examining care provided by clinicians specializing in pediatrics. The provision of counseling was not associated with a significant increase in time spent with physician at either timepoint (Table 2).

Overall, in 2009–2011, 86.5% of well-child visits included screening for tobacco use, while 11.1% included tobacco counseling (Table 3). There were significant differences by age-group for both counseling ($P < .05$) and screening ($P < .005$) at well-child visits. Children aged between 13 and 18 years were most likely to receive tobacco counseling (17.7%) but least likely to receive tobacco

screening (78.1%). Multivariate logistic regression for factors independently associated with counseling rates for the 2009–2011 time period is presented in Table 4. Children seen at visits classified as “preventative care” were significantly more likely to receive counseling compared with children seen at acute care visits (OR 5.6, 95%

Table 3. Prevalence of Tobacco Counseling and Tobacco Use Screening at Well-child Visits for Children Younger than 19 Years, 2009–2011

	N	% Visits screening ^a	% Visits counseling ^b
Overall age	7 076	86.5	11.1
0–1 y	3 429	89.9	9.5
2–4 y	1 139	87.6	8.7
5–12 y	1 586	84.3	11.8
13–18 y	922	78.1	17.7

^a $P < .001$.

^b $P < .05$.

Table 1. Prevalence of Tobacco Counseling at Medical Visits for Children Younger Than 19 Years, 1997–1999 Versus 2009–2011

	1997–1999 % Visits	2009–2011 % Visits	P
Overall	1.5%	3.8%	<.001
Age			
0–1 y	0.7	5.3	<.001
2–4 y	0.6	3.3	<.001
5–12 y	1.2	3.0	<.05
13–18 y	3.5	3.8	.71
Race			
White	1.5	4.0	<.001
Black	1.7	3.0	.12
Other	2.0	2.8	.41
Ethnicity			
Non-Hispanic	1.7	3.9	<.01
Hispanic	1.3	3.5	<.01
Insurance			
Private	1.4	3.1	<.05
Medicaid	1.9	4.7	<.05
Self-pay	0.7	4.4	<.01
Other	2.3	2.6	.53
Visit diagnosis			
Well-child	4.1	11.1	<.001
Asthma	4.3	6.6	.22
OM	0.3	2.2	<.01
Both asthma and OM	1.2	1.7	.81
All other diagnoses	0.9	1.2	.17
Clinician type			
Physician Only	1.5	3.8	<.001
Mid-level practitioner only (NP, PA)	4.1	3.8	.90
Clinician specialty			
General/family practice	1.8	2.1	.69
Pediatrician	1.6	5.1	<.001
All other	0.9	1.1	.62

NP = nurse practitioner; OM = otitis media; PA = physician's assistant.

Table 2. Visit Length in Minutes at Well-child Visit

Yes	No counseling	Counseling provided	<i>P</i>
1997–1999	17.3 (16.2–18.4)	17.6 (15.2–20.0)	.73
2009–2011	20.5 (19.7–21.3)	22.1 (19.9–24.4)	.15

Table 4. Multivariate Logistic Regression Model of Factors Associated With Tobacco Counseling at Medical Visits for Children 18 Years and Younger: 2009–2011

	OR (95% CI)	P
Age		
0–1 y (referent)	1.0	
2–4 y	1.0 (0.8–1.3)	.83
5–12 y	1.0 (0.8–1.4)	.82
13–18 y	1.8 (1.2–2.5)	<.01
Race		
White (referent)	1.0	
Black	0.6 (0.3–0.9)	<.05
Other	0.7 (0.4–1.2)	.15
Ethnicity		
Hispanic (referent)	1.0	
Non-Hispanic	1.5 (1.0–2.3)	.08
Insurance		
Private (referent)	1.0	
Medicaid	1.9 (1.2–3.2)	<.05
Self-Pay	2.3 (1.1–4.9)	<.05
Other	1.0 (0.4–2.2)	.92
Visit diagnosis		
Well-child	2.6 (1.6–4.3)	<.001
Asthma	4.2 (2.8–6.2)	<.001
OM	2.1 (1.2–3.7)	<.05
Both asthma and OM	2.0 (0.2–15.3)	.52
All other diagnoses (referent)	1.0	
Clinician type		
Physician only (referent)	1.0	
Mid-level practitioner (NP, PA)	1.0 (0.4–2.4)	.92
Physician specialty		
General/family practice (referent)	1.0	
Pediatrician	2.4 (1.4–4.1)	<.01
All other	1.0 (0.5–2.1)	.96
Problem type		
New, < 3 mo (referent)	1.0	
Chronic, routine	1.6 (0.9–2.8)	.13
Chronic, flare	2.3 (1.0–5.1)	<.05
Pre/post surgery	1.7 (0.5–6.7)	.42
Preventive care	5.6 (3.4–9.3)	<.001

CI = confidence interval; NP = nurse practitioner; OM = otitis media; OR = odds ratio; PA = physician's assistant.

CI 3.4–9.3), as were children seen by pediatric providers (OR 2.4, 95% CI 1.4–4.1). Children with asthma were four times as likely (OR 4.2, 95% CI 2.8–6.2) and children with OM two times as likely (OR 2.1, 95% CI 1.2–3.7) to receive smoking cessation counseling than children at sick visits with all other diagnoses. At well-child visits, 38.4% of children currently using tobacco received counseling compared with 21.6% at all other visit types ($P = .21$, Table 5).

Discussion

This study reveals a marked improvement in tobacco counseling at pediatric visits, especially at well-child visits (from 4.1% in 1997–1999 to 11.1% in 2009–2011). While only 3.8% of all pediatric visits included tobacco counseling in the most recent years investigated, this is a discernable improvement when compared with 1.5% of pediatric visits in 1997–1999. In bivariate analyses, there has been a marginal increase in counseling at visits for OM but no increase for children's visits for asthma or for any other diagnosis. Multivariate analyses, however, reveal that in 2009–2011, visits where the child presented with asthma were four times more likely and OM two times more likely to include cessation counseling compared with visits for other problems. Perhaps most notably, there were significant increases in counseling by pediatricians but not by mid-level providers or general/family physicians, and in contrast to 1997–1999, pediatricians provided counseling more often than mid-level providers or general/family physicians in 2009–2011. This may reflect changes in pediatric residency program curricula; surveys of program directors support that from 2001 to 2010/2011 there was an increased focus on prevention of cigarette smoking in residency curricula.^{33,34} Because mid-level practitioners were providing smoking cessation counseling at a much higher rate than clinicians in 1997–1999 (4.1% vs. 1.5%), it could be stated that the large increase seen by pediatricians was simply catching up to what mid-level providers were already doing.

The present study is consistent with prior studies on pediatricians' self-report of cessation counseling, ranging from 2% to 8%.^{31,35,36} The reported counseling rate for visits of infants from birth to age one has greatly increased from 0.7% to 5.3% but should still be considered low, given the increased health risks of SHS exposure in the early years of life. Additionally, smoking cessation counseling in visits for OM continue to be rare, even though there is an extensive literature documenting the independent association between SHS and OM.^{37,38} Moreover, an increase in smoke-free homes is associated with decreased rates of clinical encounters for OM.^{39,40}

It should be noted that there was no significant improvement in tobacco counseling at medical visits for black children or children with a reported race of "other" ($P = .12$; $P = .41$, respectively). However, significant improvements could be seen at visits for both Hispanic and non-Hispanic children ($P < 0.01$), with rates of counseling for Hispanic children only slightly lagging behind non-Hispanic children by 2011. The Healthy People 2020 objectives aim to increase screening for tobacco use by 10% in office-based and hospital ambulatory care settings and highlight disparities in

receiving such screening by both race and ethnicity.⁴¹ Our findings confirm the need to improve tobacco cessation screening and counseling, especially among racial minorities, and indicate that some progress may have been made in decreasing the gap in services by ethnicity.

Pediatricians have remarkably powerful positions in efforts to reduce parental smoking.⁴² Parents visit their child's health care provider's office much more frequently than that of their own primary care physician.⁴³ Uninsured parents are disproportionately smokers, often do not have access to a primary care provider, but do have access to the health system through their children.⁴⁴ Moreover, the number of uninsured working-age adults is far greater than the number of uninsured children.⁴⁵ Pediatricians can provide counseling to expectant and current parents to quit, assist parents in continuing their tobacco cessation, counsel adolescents to prevent initiation of tobacco use, and counsel adolescents to quit using tobacco.^{44,46,47} Successful intervention can add an average of 7 years to a parent's life, improve their quality of life,⁴⁸ and improve the health of other household members, including children.⁴⁹

Smoking cessation counseling interventions are one of the most effective and cost-effective ways to reduce child exposure to SHS.^{50–54} The existing recommendations by the American Academy of Pediatrics and US Public Health Service advocate that all pediatric health care providers document tobacco use and SHS exposure at all clinical visits, educate families about the harms of tobacco use and SHS exposure, and provide the appropriate advice to help users quit with the help of pharmacotherapy, community cessation programs, and nicotine replacement products.^{27,55,56} Despite these recommendations, it is well-known that clinicians infrequently screen or counsel parental smokers about quitting.^{27,57} As demonstrated in Table 3, there is a large gap between screening and counseling rates at well-child visits. Although most clinicians are aware of the potential benefits of smoking cessation counseling, there are a number of individual- and system-level barriers to incorporating tobacco screening and counseling in the pediatric care setting. Many clinicians are ambivalent about raising such issues with their patients as a result of uncertainty about the effectiveness of counseling patients and their receptiveness to such strategies,⁵⁸ even though they are comfortable doing so in adult health settings.^{52,59} They have also have cited lack of counseling skills and educational resources and stress as reasons why they do not routinely screen for or counsel regarding smoking.^{60–64} Lack of time is often one of the most commonly given reasons for not counseling on cessation.^{65,66} Although the present results do not show an increase in visit length, it has been shown that the effectiveness of counseling does increase with the session length.²³

There are a number of potential limitations deserving of mention. Both NAMCS and NHAMCS are cross-sectional surveys, and as such, inferences regarding causality cannot be made. Data rely on self-report by clinicians—it has been found that clinicians tend to overestimate the rate at which they counsel, and thus the actual rates of screening and counseling may be lower.⁶⁷ These data do not enable us to separate out differential rates of counseling by primary care clinicians versus that of subspecialists. Further, potentially influential elements, such as socioeconomic factors, were not available in the datasets, and it is not at all clear why counseling did not increase significantly among black families. There is some evidence in the adult literature that race, ethnicity, and socioeconomic status all impact the rates of tobacco cessation counseling by physicians.⁶⁸ There were no available data to analyze the quality of the counseling intervention or the time spent on counseling. Finally, these data represent an

Table 5. Counseling for Current Tobacco Users (2009–2011)

Visit diagnosis	N	% Visits	P
Well-child	28	38.4%	.21
All other	411	21.6%	

individual visit and the provider may have screened and counseled for tobacco use at a visit in the recent past.

Great improvements have been made over the past decade in smoking cessation counseling in pediatric settings, especially at well-child visits. Further, rates of screening for tobacco use are approaching 90%, an achievement we believe truly deserving of commendation. Yet in light of persistent tobacco use by parents and the emerging epidemic of alternative tobacco product use among adolescents and young adults,^{69,70} it is essential to recognize that the battle is far from won. It is critical that pediatric practitioners continue to take an active role in guiding and educating smokers and embrace their role in the arena of tobacco use prevention and cessation.

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Declaration of Interests

The authors have no conflicts of interest relevant to this article to disclose.

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