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Black vs White Differences in Rates of Addressing Parental Tobacco Use in the Pediatric Setting

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Abstract

Objective—To examine racial differences in rates of screening parents for cigarette smoking during pediatric outpatient visits and to determine if a parental tobacco control intervention mitigates racial variation in whether cigarette smoking is addressed.

Methods—As part of the CEASE RCT, exit interviews were conducted with parents at 10 control and 10 intervention pediatric practices nationally. Parents were asked to report if during the visit did anyone ask if they smoke cigarettes. A generalized linear mixed model was used to estimate the effect of black vs white race on asking parents about cigarette smoking.

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Results—Among 17,692 parents screened at the exit interview, the proportion of black parents who were current smokers (16%) was lower than the proportion of white parents who smoked (20%) ($p < .001$). In control group practices, black parents were more likely to be asked (ARR 1.23; 95% CI: 1.08, 1.40) about cigarette smoking by pediatricians than whites. In intervention group practices both black and white parents were more likely to be asked about smoking than those in control practices and there was no significant difference between black and white parents in the likelihood of being asked (ARR: 1.01; 95% CI: 0.93, 1.09).

Conclusions—Although a smaller proportion of black parents in control practices smoked than white, black parents were more likely to be asked by pediatricians about smoking. The CEASE intervention was associated with higher levels of screening for smoking for both black and white parents.

Keywords

pediatrics; smoking cessation; tobacco smoke; tobacco control; racial differences

Introduction

The serious health risks associated with cigarette smoking are well-documented. Every day over 1,200 people in the United States die as a result of smoking.¹ In 2010 the United States Surgeon General reported that annually, one in every five deaths is caused by cigarettes and reaffirmed that there is no safe level of tobacco smoke exposure (TSE).² In addition to causing numerous cardiovascular and respiratory diseases, smoking cigarettes has been linked to increased risks of several cancers, including lung, cervical, pancreatic, kidney, and leukemia.³ Smoking during pregnancy is associated with prenatal mortality, pre-term delivery, low birth weight, sudden infant death syndrome, and stunted lung development,³ as well as several birth defects, including cardiovascular, musculoskeletal, limb reduction, and facial defects.⁴ Persons who smoke are recommended to quit smoking to improve both their health and the health of their family.

Non-smokers experience serious health risks and premature death due to exposure to tobacco smoke that is emitted from a burning cigarette or exhaled by a smoker.^{5,6} Between 2007 and 2008, 88 million non-smokers, were subjected to tobacco smoke exposure (TSE).⁷ Children are at an even greater risk of exposure to tobacco smoke than adults; almost 22 million, or nearly 60% of children aged 3-11 years, are exposed to tobacco smoke annually.⁸ Childhood TSE is associated with ear infections, asthma exacerbations, and acute respiratory infections.⁸ Non-smoking pregnant women who are exposed to tobacco smoke face increased risk of stillbirth and offspring with congenital malformations.⁹ To minimize smoking-related health issues in children and adults, pediatricians should consistently address smoking with all patients, by identifying smokers and documenting tobacco use status.^{10,11,12} Previous studies show that parent-targeted cessation intervention can increase quit rates,^{13,14} as the pediatric office visit serves as a unique teachable moment to reduce or even eliminate childhood exposure to tobacco smoke.¹⁵ Parents usually see their child's pediatrician more regularly than their own adult primary care physician,¹⁶ and parents may be more accepting of tobacco cessation assistance when offered within the context of their child's healthcare visit.¹⁷

In 2011, 19.4 (95% CI: 18.1 - 20.8) percent of black adults smoked and 20.6 (95% CI: 19.8 – 21.4) percent of white adults smoked,¹⁸ but blacks carry a higher health burden from tobacco-related diseases compared to whites.¹⁹ The higher tobacco-related health burden experienced by blacks may be related to fewer home smoking bans,²⁰ higher rates of smoking mentholated cigarettes,²¹ which research shows increases addiction and makes it more difficult to quit, and less access to medical care compared to whites.²² Fewer home smoking bans among black families may be due to lower rates of black parents receiving anticipatory guidance related to reducing environmental asthma triggers.²³ Although tobacco use is associated with higher health risks among black smokers than white smokers, previous research has demonstrated that ethnic and racial minorities are less likely to receive cessation services from their own clinicians.^{24,25}

At least one study has examined racial and ethnic disparities in parental tobacco control in the pediatric setting and found that pediatricians are more likely to ask minority parents about tobacco use.²⁶ This report was based on data collected in 2000 from a national telephone survey with parents or guardians about services received in the last 12 months. Immediate exit survey data collection is considerably more accurate than telephone surveys, as delayed measurement of services can cause an overestimation of the actual services received.^{27,28} Additionally, the validity and accuracy of exit interviews in the context of smoking cessation interventions has been established.²⁹

The aim of this study was to examine the difference in the proportion of black vs. white parents being asked about their cigarette smoking. Further, we wanted to determine if a parental tobacco control intervention mitigates racial differences in screening parents for cigarette smoking.

Patients and Methods

We analyzed data collected at twenty pediatric practices recruited from Pediatric Research in Office Settings (PROS), the practice-based research network of the American Academy of Pediatrics (AAP). PROS practices that (1) had at least 3 practitioners, (2) were not housed within a medical school or parent university, (3) saw at least 50 patients per day, and (4) saw at least 10 patients per day that had 1 or more parent smokers were eligible for the study.³⁰ The first eligible practices that responded were randomized to either the intervention or control arms (10 practices each) of a cluster randomized control trial, Clinical Effort Against Secondhand Smoke Exposure (CEASE). Clinicians in practices that were assigned to the intervention group were trained to implement a pediatric office-based intervention to address parental tobacco use.^{14,16,31} The 10 intervention practices were located in 8 states (IL, MA, MD, OH, OK, OR, SD, and WV) as were the 10 control practices (AK, CT, MO, NM, PA, SC, TN, and VA). The study protocol was approved by the Institutional Review Boards (IRBs) of the AAP and Massachusetts General Hospital. The protocol was also approved by individual practice IRBs when required.

After practices in the intervention group were trained to conduct routine screening for parental tobacco use, a research assistant (RA) approached all adults (smoking and non-smoking) as they exited their child's healthcare visit at each intervention and control

practice. The RA administered a Screening Questionnaire to the adults (hereafter referred to as “parents”) that collected demographic information such as parent's age, gender, race, ethnicity, level of education, age of the youngest child present at the visit, and how the visit was paid for (private insurance, Medicaid, self-pay, or some other way). To determine a parent's race, each parent was given the option to choose one or more of the following answers: White, Black or African American, Asian, Native Hawaiian or other Pacific Islander, or American Indian or Alaska Native. Smoking status was established with the question: “Have you smoked a cigarette, even a puff, within the past 7 days?” To determine whether or not parents were asked about smoking during their child's visit, parents were asked the question: “At any time in your visit today did anyone ask if you smoke cigarettes?” Parents who indicated on the Screening Questionnaire that they have smoked a cigarette, even a puff, within the past 7 days were offered the opportunity to complete a consent form and enroll in the research study. The data used for this analysis came from the Screening Questionnaire and was collected from 2009 to 2011.

Statistical Analysis

We excluded respondents who did not report being the parents or legal guardian of the children they accompanied. Using chi-square tests, we compared characteristics of parents in intervention and control practices. Multivariate analyses were conducted to examine the effect of parent race on the likelihood of parents being asked about smoking. We used a generalized linear mixed model to estimate the adjusted risk ratio (ARR's) that included practice site as a random effect. In the model we assessed if parents were asked about smoking, and included indicator variables for parent race and ethnicity (Hispanic, non-Hispanic black, non-Hispanic Asian, and non-Hispanic Native American/Pacific Islander with non-Hispanic white as the referent), parent type (mother vs. father/legal guardian), insurance type (Medicaid vs. private insurance/self-pay), visit type (well child vs. sick visit), child age (<1 year vs. older), and parent age. Parents who indicated more than one race were recoded, giving priority first to black, then Asian, then Native American/Pacific Islander race. If a parent reported being white and any other race, they were recoded as the other race.

Frequencies of blacks and whites being asked about smoking were tallied and compared by study condition using two-tailed t-tests. Stata statistical software was used for all analyses with the addition of the gllamm package for mixed model estimation.^{32,33}

Results

Figure 1 shows the study enrollment flow diagram by control and intervention conditions. Five percent of the 18,607 total screened were not parents or legal guardians and therefore were excluded from the analysis, leaving 17,692 parents (control N=9,457; intervention N=8,235). Table 1 presents characteristics of screened parents at both intervention and control practices. Overall, a majority of parents in both conditions were female (control 81%; intervention 82%) and non-smokers (control 83%; intervention 80%). Among the 17,692 parents screened, the proportion of white parents that were smokers (20%) was higher than that of black parents (16%) ($P<.001$). The intervention group had a larger white

population, and was less racially diverse, but had similar education, age, and insurance status compared to the control group. These characteristic differences may have been a result of practice-level randomization. Of the 17,692 screened parents, 11,644 self-identified as white and 2,895 as black. The percentage of black parents among those screened varied from 1% to 63% across the 20 practices (median 5%). In control practices the median was 6% (IQR: 1%-59%), and in intervention practices the median was 3% (IQR: 1%-31%). In control practices, 19% of white vs. 16% of black parents smoked. Intervention practices had a similar trend, where 21% of white vs. 14% of black parents smoked.

Table 2 shows the proportion of parents that reported being asked about smoking status during the pediatric office visit. The proportion of black parents that were asked about smoking was more than double compared to white parents (30% vs 12%, $p<0.001$) in control practices but in intervention practices white parents were slightly more likely to have been asked about smoking (68% vs 71%, $p=0.04$). The multivariable model confirmed that black parents were asked about smoking at higher rates than whites at control practices (ARR 1.23; 95% CI: 1.08, 1.40), but there was no difference between black parents and white parents in the likelihood of being asked about smoking at intervention practices (ARR: 1.01; 95% CI: 0.93, 1.09) after adjusting for covariates and the known confounders presented in Table 2.³⁴

Discussion

This study showed that despite having a lower smoking rate, black parents at control practices were more likely to be screened for cigarette smoking than white parents. Racial differences were not observed in intervention practices, where high rates of screening of both racial groups were achieved. Our data mirrored the national smoking trends by race, with black parents being less likely to use tobacco than white parents. According to the U.S. Centers for Disease Control and Prevention (CDC), a lower proportion of black adults (18 years old) smoke than whites.¹⁸ The present study found that in the control practices black parents were more likely than white parents to be screened for smoking, and this race difference was not observed in the intervention practices.

There are possible explanations as to why the black parents were more likely to be screened for smoking than the white parents in this study. First, smoking rates are highest among those with a low education level and low socioeconomic status (SES).³⁴ Further, recent US Census data demonstrate higher levels of low SES among blacks.³⁵ The pediatricians in this sample may be incorrectly associating the black parents seen in their office as low SES parents who are more likely to smoke.

Another theory relates to the fact that in general, blacks are at a significant disadvantage in access to quality health care, compared to whites.³⁶ Within the adult clinical setting, research shows pervasive disparities in providing tobacco cessation services to minorities.³⁷ Also, minority children, specifically black children, suffer disproportionate rates of health disparities compared to white children, with greater disparities seen in access to care, quality of healthcare, health status, and increased rates of mortality.³⁸ It is possible that the pediatricians from the PROS practices in this study were more aware of health disparities

than other healthcare clinicians and they may have attempted to compensate for these known disparities by increasing tobacco control services to black families. In the absence of training in universal tobacco control within the pediatric setting, clinicians might feel compelled to bias more of their screening efforts on black parents or on other groups of people about whom they may have preconceived beliefs.

It is well documented that racial disparities in the U.S. contribute to differential treatment for affected groups.³⁹ However, examinations of racial disparities for addressing tobacco use in healthcare settings have shown mixed results. Two studies have found that blacks are less likely to receive advice to quit smoking by a healthcare provider.^{25, 40} Another study demonstrated that black women visiting their prenatal care provider received less cessation advice than white women.⁴¹ In contrast, other studies have suggested that black women were more often asked⁴² and advised^{42,43} about their smoking compared to white women by prenatal care providers. In the present study, control group data showed that black parents were more likely to be asked about tobacco use. When clinicians integrated tobacco control efforts into a routine system of care through the use of the CEASE intervention, they showed high rates of screening for smoking and differences in screening between blacks and whites were not present.

The data used in this analysis came from a large national trial conducted in 16 states; however, the data are based on parent self-report, which may not accurately reflect the true incidence of the behaviors measured. The use of exit interviews immediately following the clinical encounter however, allows for greater confidence in the quality of our data than other data collection methods. Limitations relating to potential response or participation bias by race may also exist, as all practices had much larger white parent populations than any other race. The results are based on cross-sectional data, and therefore it is not possible to determine causality as to why black parents in control practices were more likely to be asked about smoking. Future studies are needed to further investigate why racial differences exist among tobacco control behaviors of pediatricians, and how these racial biases impact the care families receive. In control group practices, differential rates of asking about smoking by well child vs. sick child visit status and by child age were also present but these differences were either not seen for child age or much less apparent for visit status in intervention group practices. Therefore, one advantage of a systematic screening system as implemented in this trial is to foster and promote universal screening of all parents at pediatric visits.

Conclusion

This study highlights the need for systematic parental tobacco control within the pediatric setting. In a large national sample, we found that in the absence of intervention, black parents are more likely to be screened for smoking than white parents, although they smoke at lower rates than white parents. The CEASE intervention, which included training in routine tobacco use screening for all families, was associated with increased and more uniform rates of asking about smoking for both black and white parents. It has been established that children's exposure to tobacco smoke is a major health concern that should

be addressed by pediatricians. Therefore, all families should be screened for parental tobacco use, regardless of race.

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Abbreviations

AAP	American Academy of Pediatrics
CEASE	Clinical Effort Against Secondhand Smoke Exposure
PROS	Pediatric Research in Office Settings
TSE	Tobacco smoke exposure

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What's New

Although black parents had a lower prevalence of smoking than white parents, they were more likely to be asked about smoking in control practices. Black and white parents had an equal likelihood of being asked about smoking in intervention practices.

Figure 1.
Study enrollment flow diagram

Table 1

Characteristics of screened parents

Characteristic	Control N=9,457		Intervention N=8,235		Total N=17,692	
	N	%	N	%	N	%
<u>Parent Age</u>						
<18	42	0.4	45	0.6	87	0.5
18-24	1405	14.9	1405	17.1	2810	15.9
25-29	2040	21.6	2065	25.1	4105	23.2
30-39	3856	40.8	3326	40.4	7182	40.6
40	2070	21.9	1369	16.6	3439	19.4
Unknown	44	0.5	25	0.3	69	0.4
<u>Parent Sex</u>						
Male	1762	18.6	1509	18.3	3271	18.5
Female	7694	81.4	6724	81.7	14418	81.5
Unknown	1	0.01	2	0.02	3	<0.1
<u>Parent Race/Ethnicity</u>						
Hispanic/any race	1507	15.9	546	6.6	2053	11.6
Black (non-Hispanic)	1771	18.7	1124	13.7	2895	16.4
Asian (non-Hispanic)	252	2.7	99	1.2	351	2.0
Native American (non-Hispanic)	177	1.9	170	2.1	347	2.0
White (non-Hispanic)	5545	58.6	6099	74.1	11644	65.8
>1 race	106	1.1	119	1.5	225	1.3
Unknown	99	1.1	78	1.0	177	1.0
<u>Parent Education</u>						
<high school	568	6.0	576	7.0	1144	6.5
High school or GED	2844	30.1	2574	31.3	5418	30.6
Some college/trade school	2738	29.0	2516	30.6	5254	29.7
College (4 years)	3292	34.8	2557	31.1	5849	33.1
Unknown	15	0.2	12	0.2	27	0.2
<u>Parent smoking status</u>						
Smoker	1607	17.0	1635	19.9	3242	18.3
Nonsmoker	7844	82.9	6589	80.0	14433	81.6
Unknown	6	0.1	11	0.1	17	0.1
<u>Child age</u>						
<1 year	2451	25.9	2355	28.6	4806	27.2
1-5 years	3821	40.4	3421	41.5	7242	40.9
6-11 years	1915	20.2	1502	18.2	3417	19.3
12 years	1270	13.4	957	11.6	2227	12.6
<u>Insurance</u>						
Medicaid	3638	38.5	3475	42.2	7113	40.2

Characteristic	Control N=9,457		Intervention N=8,235		Total N=17,692	
	N	%	N	%	N	%
Private insurance	4876	51.6	4278	52.0	9154	51.7
Self pay/other/unknown	943	10.0	482	5.9	1425	8.0
<u>Parental Status</u>						
Mother	7537	79.7	6575	79.8	14112	79.8
Father	1732	18.3	1473	17.9	3205	18.1
Legal guardian	188	2.0	187	2.3	375	2.1

Table 2

Screened parents who were asked about smoking status

Characteristic	Parents Asked about Smoking Status					
	Control N=9227 [*]			Intervention N=8071 [*]		
	N	%	ARR ^{**} (95% CI)	N	%	ARR ^{**} (95% CI)
Overall	1557	17		5695	71	
<u>Parent Race/Ethnicity</u>						
Hispanic/any race	262	18	0.92 (0.79-1.08)	405	75	0.97 (0.87-1.08)
Black (non-Hispanic)	528	30	1.23 (1.08-1.40)	790	68	1.01 (0.93-1.09)
Asian (non-Hispanic)	48	18	0.99 (0.74-1.34)	86	78	1.01 (0.82-1.25)
Native American (non-Hispanic)	39	18	1.09 (0.79-1.51)	137	62	0.96 (0.81-1.14)
White (non-Hispanic)	680	12	1.00	4277	71	1.00
<u>Parent smoking status</u>						
Smoker	315	20	1.23 (1.08-1.40)	1214	75	1.11 (1.04-1.19)
Nonsmoker	1242	16	1.00	4481	69	1.00
<u>Child age</u>						
<1 year	631	26	1.43 (1.27-1.60)	1652	71	0.94 (0.88-1.00)
1 year or older	926	14	1.00	4043	70	1.00
<u>Insurance</u>						
Medicaid	746	21	1.02 (0.91-1.15)	2452	72	0.98 (0.92-1.04)
Private insurance or self-pay	811	14	1.00	3243	70	1.00
<u>Parental Status</u>						
Mother	1234	17	0.95 (0.83-1.07)	4568	71	1.03 (0.96-1.10)
Father/legal guardian	323	17	1.00	1127	70	1.00
<u>Visit type</u>						
Well child	1037	27	2.51 (2.25-2.80)	2952	80	1.30 (1.24-1.38)
Other	520	10	1.00	2743	62	1.00

* Parents missing any variable in analysis were excluded

** Adjusted rate ratio, adjusted for all factors in the table, parent age, and practice.