



Adolescent health brief

Increased Tobacco Exposure in Older Children and Its Effect on Asthma and Ear Infections

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A B S T R A C T

Purpose: To examine selected social determinants of children's exposure to household tobacco use and smoking inside the home and to assess the effect of second-hand smoke exposure on asthma and ear infections across children's age groups.

Methods: A total of 90,961 parents of children aged 0–17 years from the 2007 National Survey of Children's Health were included in the study.

Results: In all, 26.2% of parents reported that anyone in the household used tobacco products. Parents of children aged 6–11 and 12–17 years were 1.97 (adjusted OR; 95% CI, 1.65–2.36) and 2.93 (2.46–3.49) times more likely, respectively, to report that someone smoked inside the house than parents of younger children. Second-hand smoke exposure varied by children's race/ethnicity, and children from more disadvantaged circumstances were more likely to be exposed. For all children, they were more likely to ever have asthma if someone in their household used tobacco. Although young children's likelihood of recurrent ear infections did not increase with household tobacco use, children aged 12–17 were 1.67 (1.02–2.72) times more likely to have recurrent ear infections if someone smoked inside their home.

Conclusion: Family members are increasingly likely to smoke indoors as children age, which may increase adolescents' vulnerability to ear infections. Parents and health professionals should monitor second-hand smoke exposure at home and encourage a smoke-free environment.

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Although second-hand smoke exposure in the home has decreased over the past two decades in the United States, the reduction in exposure has been less in children and adolescents than in adults [1]. Currently, up to one-third of children live with a smoker [1–3] and disparities in children's exposure have been noted [2,3]. The 2006 Surgeon General report concluded that parental smoking increased children's risk of ever having asthma and recurrent ear infections [4]; however, to our knowledge

none of the studies related to ear infections included children aged >8 years [4].

We examined selected social determinants of children's exposure to household tobacco use and smoking inside the home and assessed the effect of second-hand smoke exposure on asthma and ear infections across age groups.

Methods

The National Survey of Children's Health (NSCH) is a nationally representative, random-digit-dial telephone survey of children and adolescents aged 0–17 years and their families [5]. A parent or guardian was interviewed about one randomly selected child. There were 91,642 interviews conducted between April 2007 and July 2008 (response, 46.7%). Additional information is available at <http://www.childhealthdata.org>.

There were 90,961 families included in the analyses. Families were excluded if information was missing on household smoking

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(672) or smoking in the home (9). For the child health analyses, children aged <1 year were excluded because of challenges in diagnosis (4,769).

Measures

Parents were asked whether anyone living in their household used cigarettes, cigars, or pipe tobacco, and, if yes, whether they smoked inside the house [5]. The responses were also combined to construct a measure of “patterns of household tobacco use” (no one in the household used tobacco products; household used tobacco, no one smoked inside the house; household used tobacco, someone smoked inside the house). Parents reported, separately, whether a doctor or health care provider had ever told them that the child has had asthma or three or more ear infections in the past 12 months. Parents also provided information on the sociodemographic characteristics of the child and the household.

Analyses

Analyses were conducted using STATA statistical software with “svy” commands and survey sampling weights [5].

We conducted a mutually adjusted model which examined the relationships between household tobacco use and the following socio-demographic characteristics for children and adolescents aged 0–17 years: child’s age, race/ethnicity, gender, number of children in the household, family structure, household education, employment, and income. A mutually adjusted model was also conducted for smoking inside the home (among households that used tobacco).

We tested an interaction between patterns of household tobacco use and children’s age groups (1–5, 6–11, 12–17 years) for each child health outcome using an adjusted Wald test and, if significant, analyses were stratified. We then examined the relationships between patterns of household tobacco use and child health outcomes, adjusting for all socio-demographic characteristics.

Results

In all, 26.2% of parents reported that someone in the household used tobacco products and, among those households, 29.0% reported that someone smoked inside the home. Although household tobacco use did not vary across ages, smoking inside

Table 1

Mutually adjusted odds ratios of household tobacco use and smoking inside the home (among households that used tobacco) among children aged 0–17 years

	N (%) ^a (N = 90,961)	Whether anyone in household used tobacco products		Whether anyone smoked inside home (among households that used tobacco)	
		% ^a (N = 90,961)	Adjusted OR (95% CI)	% ^a (N = 22,374)	Adjusted OR (95% CI)
Child’s age					
0–5 years	27,374 (33.2)	25.8	1.0	18.8	1.0
6–11 years	27,587 (32.5)	25.4	1.03 (.93–1.14)	29.0	1.97 (1.65–2.36)
12–17 years	36,000 (34.4)	27.2	1.07 (.97–1.17)	38.3	2.93 (2.46–3.49)
Child’s race/ethnicity					
White, non-Hispanic	61,339 (56.2)	27.3	1.0	29.2	1.0
Hispanic	11,517 (20.5)	22.6	.44 (.38–.52)	11.6	.25 (.20–.32)
African American, non-Hispanic	8,862 (14.2)	27.1	.60 (.53–.67)	50.1	1.75 (1.45–2.12)
Multiracial, non-Hispanic	4,325 (4.3)	35.5	1.26 (1.04–1.53)	30.4	1.07 (.79–1.45)
Other, non-Hispanic	3,988 (4.8)	17.8	.54 (.43–.68)	18.2	.51 (.35–.75)
Child’s gender					
Male	47,195 (51.1)	26.3	1.0	29.0	1.0
Female	43,658 (48.9)	26.0	.98 (.91–1.07)	29.0	1.00 (.88–1.15)
Number of children aged <18 years in household					
1	36,568 (23.1)	28.9	1.0	33.2	1.0
2	34,708 (38.9)	25.2	.82 (.75–.90)	27.1	.76 (.65–.89)
3 or 4	19,684 (38.0)	25.5	.72 (.66–.80)	27.9	.72 (.61–.85)
Family structure					
Two parents	70,453 (75.4)	23.9	1.0	23.3	1.0
Single parent	14,684 (18.7)	32.6	1.07 (.97–1.19)	41.2	1.47 (1.24–1.75)
Other family types	5,721 (5.9)	35.8	1.29 (1.07–1.56)	41.9	1.65 (1.28–2.14)
Highest education in household					
Less than high school/high school graduate	20,852 (33.2)	37.3	1.84 (1.66–2.03)	35.4	1.46 (1.27–1.68)
More than high school	69,695 (66.8)	20.7	1.0	23.2	1.0
Whether anyone in household was employed for at least 50 of the past 52 weeks					
No	8,133 (11.8)	32.8	.96 (.84–1.10)	39.8	1.20 (.97–1.48)
Yes	82,382 (88.2)	25.3	1.0	27.1	1.0
Household income					
0%–99% federal poverty level	10,856 (18.6)	36.9	3.34 (2.83–3.93)	37.1	2.95 (2.33–3.73)
100%–199% federal poverty level	15,466 (21.0)	33.9	2.87 (2.52–3.28)	32.5	2.71 (2.20–3.33)
200%–399% federal poverty level	30,600 (31.1)	25.1	1.85 (1.66–2.06)	26.3	2.01 (1.65–2.44)
400% federal poverty level or greater	34,039 (29.4)	14.9	1.0	15.3	1.0

Missing values (N = 90,961): Child’s race/ethnicity (930), child’s gender (108), number of children in household (1), family structure (103), highest education in household (414), whether anyone in household was employed (446).

CI = confidence interval; OR = odds ratio.

^a Weighted percent.

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