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A Second Reporter Matters:

Agreement Between Parents' and Children's Reports of Smoking Bans in Families

Ding Ding, MPH, Dennis R. Wahlgren, MA, Sandy Liles, MPH, Georg E. Matt, PhD, McKenzie Oliver, MPH, Jennifer A. Jones, MPH, and Melbourne F. Hovell, PhD, MPH
Graduate School of Public Health (Ding, Wahlgren, Liles, Jones, Hovell), Department of Psychology (Matt), San Diego State University, San Diego; Department of Family and Preventive Medicine (Ding), University of California San Diego, La Jolla; School of Public Health (Oliver), University of California Berkeley, Berkeley, California

Abstract

Background—Home and car smoking bans implemented by caregivers are important approaches to reducing children's secondhand smoke (SHS) exposure and attendant health risks. Such private smoking bans are usually informal and are subject to individuals' interpretation, observation, and recall. Relying on a single reporter may lead to misclassification of bans in families.

Purpose—To determine (1) proportion of families with discordant reports of bans; (2) association between parent-child report agreement and SHS exposure; and (3) whether including a second reporter of bans improves prediction of child SHS exposure.

Methods—In each of 386 participating families a preteen and a parent reported separately on their home and car smoking bans, and agreement was determined. ANOVA, chi-square, and multiple regression were used to determine relationships between SHS exposure (measured by urine cotinine and reported exposure) and home/car smoking bans reported by preteens and parents.

Results—In 19% of families, reports disagreed for home smoking bans; 30% for car smoking bans. Families who agreed on the presence of a ban had the lowest exposure, families who agreed on the absence of a ban had the highest exposure, and intermediate exposure for those who disagreed. Parent and child reports of bans each explained significant, unique variance in child SHS exposure.

Conclusions—Due to relatively high prevalence of discordant reporting, a more accurate classification of home/car bans may result from including multiple reporters.

Introduction

Despite well established harms of secondhand smoke (SHS) to young people,^{1, 2} 18% of children and 17% of adolescents in the U.S. lived with a smoker who smoked inside the

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Address correspondence to: Ding Ding, The Center for Behavioral Epidemiology and Community Health, 9245 Sky Park Ct. Suite 230, San Diego CA, 92123. dding@projects.sdsu.edu.

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home, resulting in a total of 32 million young people being exposed to SHS during 2007–2008.³

Increasing attention to smoking bans in private locations (e.g., homes or personal cars)⁴ has led to legislative efforts such as smokefree car policies when a minor is the car.^{5, 6} Private smoking bans are important because homes and cars are the primary locations for SHS exposure to nonsmokers, especially youth.⁷⁻¹¹ Evidence suggests that bans may reduce SHS exposure among youth.^{9, 12}

Policies banning cigarette smoking in public places are explicit punishment contingencies (e.g., fines). Private smoking bans,¹³ however, usually lack a clear definition, are less formal and more difficult to enforce. Private bans are a class of behaviors (e.g., posting no-smoking signs, not providing ashtrays) with the similar function of deterring smoking in private settings. Classification of private smoking bans relies on an individual's observation, recall, and report.¹³⁻¹⁵ Discrepancies can occur among different reporters in the same household,¹⁶ especially parents versus children.¹⁷

Multiple factors influence effectiveness of a ban, such as degree of enforcement and frequency of violation. No study has examined how report agreement on private smoking bans relates to SHS exposure in private locations. The current study examined parent–child report agreement on home smoking ban (HSB) and car smoking ban (CSB) in families with children and smokers. The objectives of this study were to (1) determine the proportion of concordant and discordant reports of HSB and CSB, (2) examine the association between child SHS exposure and the parent–child agreement on bans, and (3) explore violations of bans.

Methods

Participants

Participating families completed the baseline survey for an RCT of SHS reduction. Detailed information about recruitment and the sample has been published elsewhere.^{18, 19} Briefly, 388 families with a child aged 8–13 years and at least one smoker living in the home completed baseline interviews between 2004 and 2007 in San Diego, California. The final sample included 373 families for HSB analyses and 347 for CSB analysis. The San Diego State University IRB approved all procedures.

Children were on average aged 10.3 years (SD=1.6); 54% were female, 33% were black, 41% white, and 25% other; 46% were Hispanic ethnicity. Most (62%) parents had completed high school, and household income levels were substantially lower than the County's median income.²⁰

Measures

Face-to-face interviews were conducted in English or Spanish by trained interviewers, separately for parent and child, followed by the child's urine collection.

Home/car smoking ban—As suggested by previous studies,^{13, 21-23} HSBs were dichotomized into complete HSB if “no one is allowed to smoke inside ever” and no complete HSB otherwise. Additional questions regarding ban violation were asked of those who reported complete HSBs. Parent–child report agreement was defined as: “agreement on having a ban,” “disagreement,” or “agreement on not having a ban.” CSBs were coded similarly.

Biomarker for SHS Exposure—Urine cotinine was assessed as a biomarker for exposure to nicotine.^{24, 25} Isotope-dilution liquid chromatography–tandem mass spectrometry was used. The reliability coefficient for blinded split-half urine samples was $r=0.99$ ($p<0.001$). Values were positively skewed, and were log transformed for data analyses.

Reports of SHS Exposure—Parent and child separately recalled the child’s cigarette exposure in specific locations (home, car, other) on each of the past 7 days. The average daily number of cigarettes to which the child was exposed in the past week was computed separately for parent and child reports.²⁶ Due to highly skewed distribution, and to emphasize complete absence of SHS exposure, variables were dichotomized into “zero” and “any” reported exposure.

Data Analyses

Analyses were conducted using SPSS v15.0 in 2010 and a two-tailed alpha of 0.05. ANOVA and Pearson Chi-square tests were used to examine ban agreement and child SHS exposure.

A series of linear regression models were constructed to predict log transformed cotinine. Each model consisted of a block of covariates (i.e., baseline model, including the child’s age, gender, and total number of smokers in the household) and a second block that included smoking ban measures (parent-reported ban in Model 1, child-reported ban in Model 2, and both reports in Model 3).

To explore a possible mechanism of report disagreement, frequencies of ban violation were compared among families in which an existing HSB/CSB was reported by: (1) both parent and child, (2) parent only, and (3) child only.

Results

About half (49%) of parent–child pairs agreed on having a HSB, 19% disagreed, and 31% agreed on no HSB. Only 28% agreed on having a CSB, 30% disagreed, and 43% agreed on no CSB. Based on both urine cotinine and reports, the SHS exposure was the lowest if parent and child agreed on having a HSB/CSB, highest if both agreed on not having a ban, and intermediate if parent and child disagreed (Table 1).

As Table 2 presents, parent-reported and child-reported HSBs were significant individual predictors of child urine cotinine (Models 1 and 2) and were also independently predictive of cotinine when both reports were included together (Model 3). Parent and child reports together (Model 3) explained 6% more variance in cotinine compared to parent report only (Model 1) and 13% more variance compared to child report only (Model 2). The increases in R^2 were significant ($p<0.05$) in all three models. Similar patterns were found for CSB.

When only the parent reported a complete HSB, 68% of them indicated at least occasional ban violation. When only the child reported a complete HSB, 76% reported violation. But when both agreed on a having HSB, only 39% of the parents and 48% of the children reported violation. Similar patterns were found for CSB.

Discussion

Smoking bans in private locations are important targets for SHS reduction. Private bans are informal, underspecified, and sometimes inconsistently enforced, posing challenges for measurement, health risk assessment, and intervention evaluation. Inter-reporter agreement on private smoking bans should be investigated to understand the circumstances under

which reporters disagree, and how discrepant reports relate to effectiveness of private smoking bans.

Conclusion

A substantial percentage of parent–child pairs disagreed on reports of private smoking bans. SHS exposure was the lowest when both reporters agreed on the presence of bans. Parent and child reports of bans independently contributed to the prediction of exposure. Reported ban violations were less frequent when reports of the presence of smoking bans were in agreement. Discrepancies in parent and child report may be partially due to different interpretation of survey questions. In some instances, one individual reported having a complete ban, although acknowledging violation, while the other individual in the same household reported not having a complete ban.

Implications

Discrepant reports indicate the potential for misclassification of private smoking bans based on a single report. In the current study, when only the parent or child’s report was used, ban prevalence was about 10% higher than when both reports were considered. Overestimation of bans might bias observational studies and increase Type I error in experimental trials testing interventions to promote complete home/car bans.

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Table 1

Secondhand smoke (SHS) exposure by home/car smoking ban agreement

	<i>n</i>	Urine Cotinine	Reported SHS exposure in the home	
		Geometric M (95% CI) (ng/mL)	Parent-reported zero exposure (%)	Child-reported zero exposure (%)
Home smoking ban				
Agreement: ban	183	2.08 (1.90,2.28)	55.2	60.3
Disagreement	71	3.72 (2.94,4.70)	28.2	38.0
Agreement: no ban	116	5.90 (4.92,7.08)	19.0	24.6
		<i>F</i> =57.01 <i>p</i> <0.001	χ^2 =43.36 <i>p</i> <0.001	χ^2 =38.77 <i>p</i> <0.001
	<i>n</i>	Urine Cotinine	Reported SHS exposure in the car	
		Geometric M (95% CI) (ng/mL)	Parent-reported zero exposure (%)	Child-reported zero exposure (%)
Car smoking ban				
Agreement: ban	95	1.93 (1.75,2.27)	98.9	97.9
Disagreement	103	2.64 (2.27,3.09)	83.5	86.4
Agreement: no ban	146	4.37 (3.74,5.09)	61.0	75.7
		<i>F</i> =27.99 <i>p</i> <0.001	χ^2 =51.14 <i>p</i> <0.001	χ^2 =22.83 <i>p</i> <0.001

Table 2
 Linear regressions of child urine cotinine on child- and parent-reported smoking bans

	Home smoking bans (n=373)			Car smoking bans (n=347)		
	Model 1: Baseline model + parent report	Model 2: Baseline model + child report	Model 3: Baseline model + both reports	Model 1: Baseline model + parent report	Model 2: Baseline model + child report	Model 3: Baseline model + both reports
Parent-reported ban	-0.482 ***		-0.419 ***	-0.314 ***		-0.234 ***
Child-reported ban		-0.357 ***	-0.107 *		-0.299 ***	-0.206 ***
ΔR^2 compared to baseline model ^a	0.20 ***	0.13 **	0.26 ***	0.10 **	0.09 **	0.15 ***

^a Baseline model includes child's age, gender, and number of smokers living in the home

* p<0.05,

** p<0.01,

*** p<0.001