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Screening for Adolescent Smoking among Primary Care Physicians in California

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ABSTRACT

Objectives. This study determined how often primary care physicians ask adolescents about smoking.

Methods. We surveyed a stratified random sample of community-based, board-certified California physicians, using a mailed questionnaire.

Results. Overall, physicians ($n = 343$; 77% response rate) screened younger adolescents for regular smoking during 71.4% (95% confidence interval [CI] = 67.9, 74.9) of routine physical exams and older adolescents during 84.8% (95% CI = 82.3, 87.4) of such visits. For acute-care visits, the screening rates were 24.4% (95% CI = 20.6, 28.1) for younger and 40.2% (95% CI = 36.4, 44.0) for older adolescents. Physicians asked 18.2% (95% CI = 15.2, 21.3) of younger and 35.6% (95% CI = 32.0, 39.1) of older adolescents about experimental smoking. Screening varied by specialty.

Conclusions. These data imply that physicians are missing opportunities to screen adolescents for smoking. (*Am J Public Health*. 1997;87:1341-1345)

Introduction

Smoking remains a serious health problem in the United States. Most adult smokers began their habit during adolescence.¹⁻⁴ Physicians can potentially have a significant impact on smoking cessation in adolescents.^{4,5-10} As part of an effort to reduce smoking in adolescence, physicians need to screen adolescents for smoking.¹¹ Few data exist about the rates of physician screening of adolescents for smoking.¹²⁻¹⁵ In this study, we examined how often community-based physicians in the state of California screen their adolescent patients for smoking. In addition, we hypothesized that screening for smoking would vary by specialty and physician's sex,¹⁵⁻¹⁷ as well as by exposure to smoking-related diseases, both personally and in the practice setting, previous smoking-cessation training, attitudes towards adolescent patients, and attitudes about smoking cessation.^{6,18-20}

Methods

Physician Selection

We used a mailed questionnaire to survey a stratified (by specialty, geo-

graphic area, and sex) random sample of community-based, board-certified, specialists in pediatrics, family practice, and internal medicine or specialists in adolescent medicine (primarily pediatricians) who practice in California and spend at least 50% of their patient care time in primary care. Physicians who met study criteria were chosen randomly from the *American Board of Medical Specialties Compendium of Certified Medical Specialists*. Adolescent medicine specialists were obtained from the membership roster of the Society for Adolescent Medicine or were identified as a member of the Section for Adolescent Health of the American Academy of Pediatrics; all adolescent medicine specialists were included in the study. The final sample included only physicians who graduated from medical

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school in the United States from 1970 through 1985, a period following the release of the surgeon general's report, when the dangers of smoking and the need for prevention were clear.²¹ Female physicians were oversampled to compose 40% of the initial sample. Physicians who practiced in a full-time academic setting or military institution were excluded, as were those who saw no adolescents in their practice.

Procedure

A mailed questionnaire was used to assess practice patterns. A modest payment was included with the questionnaire, and nonresponders received phone calls and a second mailing. Questionnaires were coded so that respondents were assured anonymity, in compliance with human-subjects guidelines.

Questionnaires were sent to 754 physicians; 70 questionnaires were returned for incorrect address, 37 physicians were not locatable for other reasons, such as no telephone number, and 65 did not return the survey or refused to participate. Therefore, the overall response rate for eligible subjects was 77%; by specialty, the response rate was 72% for family practice, 76% for internal medicine, 78% for pediatrics, and 94% for adolescent medicine. Of the returned questionnaires, 239 did not meet criteria for inclusion in the study. The final study population consisted of 343 primary care physicians who cared for adolescent patients; 104 were family practitioners, 95 were internists, 100 were pediatricians, and 44 were adolescent medicine specialists.

Measures

The questionnaire was developed with the use of existing survey instruments.^{6,14,17,22,23} The questionnaire asked physicians how frequently they queried teenagers about experimental ("ever tried") and regular smoking during both routine and acute-care visits. Questions were asked for two age groups of adolescents (younger adolescents, 11 to 14 years of age, and older adolescents, 15 to 18 years of age). Two questions were used and combined to assess rates of screening adolescents for regular smoking during routine exams (Cronbach's alpha = 0.77 and 0.82, for younger and older adolescents, respectively). The other physician behaviors were assessed with single-item measures. The questionnaire also asked about practice demographics, training experiences, personal exposure to

smoking-related disease, and attitudes towards adolescent patients and about smoking cessation.

The scale measuring physician attitudes towards adolescent patients (Cronbach's alpha = 0.71) was created with five questions that assessed the physician's level of comfort in caring for adolescent patients, beliefs about adolescent compliance, and beliefs about adolescent patients' interest in a physician's advice about health. Responses were placed on a 6-point Likert scale (1 = very uncomfortable, 6 = very comfortable). Six Likert-scale questions assessed physician attitudes towards smoking-cessation counseling (Cronbach's alpha = 0.79). These included physicians' perceptions of their own knowledge, skills, satisfaction, and confidence in performing smoking-cessation counseling and whether they felt patients would be helped to quit smoking with a physician's intervention.

Data Analyses

All analyses were performed with the use of data weighted by the actual number of male and female providers in each specialty in California. In order to assess how screening varied by specialty and physician's sex, analyses of variance (ANOVAs) were performed. Tukey pairwise comparison with an overall $P < .05$ was used to assess the differences between groups. We also performed a multivariate linear regression analysis to determine the independent contribution of physician attitudes and practice characteristics to rates of physician screening. Finally, hierarchical multiple linear regressions were used to determine whether physician characteristics and physician attitudes accounted for variations in screening by specialty.

Results

Table 1 shows the characteristics of the study sample, and Table 2 shows the rates of screening for adolescent smoking by specialty, age of adolescent, and type of visit. Overall, physicians reported screening younger adolescents for regular smoking during 71.4% of routine physical exams and older adolescents during 84.8% of such visits. For acute-care visits, the average reported screening rates were 24.4% for younger adolescents and 40.2% for older adolescents. On average, physicians responded that they asked 18.2% of younger adolescents and 35.6% of older adolescents about experimental smoking.

As shown in Table 2, the percentage of younger adolescents screened for regular smoking during a routine history and physical exam varied significantly among specialties ($P < .001$). Adolescent medicine specialists asked younger adolescents about smoking more frequently than did family practitioners, and both adolescent medicine specialists and internists asked about smoking significantly more frequently than pediatricians. Similarly, screening older adolescents for regular smoking during a routine history and physical exam also varied as a function of specialty ($P < .001$). Family practitioners, internists, and adolescent medicine specialists all screened older adolescents for smoking significantly more frequently than did pediatricians. However, the percentage of adolescents who were asked if they had ever tried smoking a cigarette during a routine history and physical exam did not vary significantly by specialty for either younger adolescents and older adolescents. The rates of screening of younger and older adolescents during an acute-care visit varied significantly among specialties ($P < .001$). During acute-care visits, family practitioners, internists, and adolescent medicine specialists screened both younger and older adolescents for smoking significantly more frequently than did pediatricians.

Overall, the rates of screening younger adolescents for regular smoking were higher among female than among male physicians during routine visits (74.5% vs 65.6%; $P < .05$) and during acute-care visits (70.6% vs 78.4%; $P < .05$). The rates of screening older adolescents for regular smoking were also higher among female compared with male physicians during both routine visits (87.9% vs 78.6%; $P < .001$) and acute-care visits (88.6% vs 81.6%; $P < .01$). There was no sex difference in the rates of screening younger and older adolescents for experimental smoking.

Multivariate analyses revealed significant associations between measured physician attitudes and variations in rates of screening for regular smoking during a routine history and physical exam. Rates of screening younger adolescents were highest among physicians who had more positive attitudes towards adolescents (standardized $\beta = 0.25$; $P < .01$) and more positive attitudes towards smoking cessation (standardized $\beta = 0.15$; $P < .05$). For older adolescents, the analysis revealed that rates of screening were independently associated with more positive attitudes towards adolescents (stan-

TABLE 1—Weighted Primary Care Physician and Practice Characteristics, by Physician Specialty: California, 1992

	Family Practice (n = 104) ^a	Internal Medicine (n = 95) ^a	Pediatrics (n = 100) ^a	Adolescent Medicine (n = 44) ^a
Age, mean (95% CI)	39.5 (38.6, 40.3)	38.3 (37.4, 39.3)	39.7 (38.7, 40.8)	41.6 (39.9, 43.3)
Male, %	77.7	75.2	55.3	47.7
Year graduated medical school, mean (95% CI)	1980 (1979, 1981)	1981 (1980, 1982)	1979 (1978, 1980)	1978 (1976, 1979)
Type of practice setting, %				
Private	61	55	60	26
HMO	30	41	35	42
Clinic	9	4	5	32
No. who see younger adolescents (11–14)	103	45	100	41
No. who see older adolescents (15–18)	104	95	97	44
No. younger adolescents seen per week, mean (95% CI)	10.0 (8.2, 11.7)	1.3 (0.8, 1.7)	18.0 (14.2, 21.7)	21.7 (15.3, 28.1)
No. older adolescents seen per week, mean (95% CI)	11.0 (9.4, 12.6)	5.8 (4.7, 6.9)	7.5 (6.1, 9.0)	30.7 (21.8, 39.5)
Months in adolescent medicine residency, mean (95% CI)	1.00	0.16	1.36	1.66
Positive attitudes towards adolescents, scale 1–6, mean (95% CI)	2.7 (2.6, 2.8)	2.5 (2.4, 2.6)	2.4 (2.2, 2.5)	3.4 (3.2, 3.6)
No. smoking-cessation trainings taken, mean (95% CI)	1.4 (1.3, 1.6)	1.2 (1.1, 1.3)	1.1 (0.9, 1.3)	1.4 (1.1, 1.7)
% Patients with smoking-related diseases, mean (95% CI)	34.6 (30.7, 38.5)	30.0 (26.4, 33.6)	16.8 (12.0, 21.7)	11.9 (6.9, 16.7)
Positive attitudes towards smoking cessation, scale 1–6, mean (95% CI)	3.3 (3.1, 3.4)	3.2 (3.0, 3.4)	2.4 (2.3, 2.6)	3.2 (2.9, 3.3)

Note. CI = confidence interval.

^aNumbers of subjects vary slightly because of missing data.

TABLE 2—Weighted Rates of Screening of Younger (11 through 14 Years Old) and Older (15 through 18 Years Old) Adolescents for Smoking, by Physician Specialty and Type of Screening: California, 1992^a

	Rate of Screening for Regular Smoking during Routine Exam, % (95% CI)		Rate of Screening for Regular Smoking during Acute-Care Visit, % (95% CI)		Rate of Screening for Ever Having Tried a Cigarette during Routine Exam, % (95% CI)	
	Younger Adolescents	Older Adolescents	Younger Adolescents	Older Adolescents	Younger Adolescents	Older Adolescents
Family practice	69.2 (63.8, 74.6)	85.2 (81.1, 89.4)	29.1 (22.6, 35.7)	50.1 (43.5, 56.6)	18.6 (13.3, 24.1)	32.5 (26.1, 39.0)
Internal medicine	80.4 (73.3, 87.6)	89.0 (85.4, 92.5)	33.0 (22.4, 43.7)	48.2 (41.0, 55.4)	10.6 (5.5, 15.8)	33.4 (27.4, 39.5)
Pediatrics	61.3 (53.7, 68.8)	74.4 (67.2, 81.7)	9.6 (6.0, 13.3)	16.0 (11.7, 20.4)	20.8 (13.9, 27.7)	39.4 (31.0, 47.9)
Adolescent medicine	85.6 (78.9, 92.4)	92.5 (87.5, 97.5)	30.6 (20.5, 40.8)	41.0 (30.3, 51.8)	20.9 (14.1, 27.7)	39.7 (30.3, 49.2)
All specialties	71.4 (67.9, 74.9)	84.8 (82.3, 87.4)	24.4 (20.6, 28.1)	40.2 (36.4, 44.0)	18.2 (15.2, 21.3)	35.6 (32.0, 39.1)

Note. CI = confidence interval.

^aRates of screening do not control for number of patients seen per week.

standardized $\beta = .14$; $P < .05$), and more positive attitudes towards smoking cessation (standardized $\beta = 0.29$; $P < .001$). For both age groups, having more positive attitudes toward adolescents was associated with screening for experimental use (standardized $\beta = 0.15$; $P < .05$).

In order to determine whether variations by specialty in physician screening of younger and older adolescents for regular smoking during a routine history and physical exam were fully accounted for by the physician demographics and attitudes, we performed two hierarchical

multiple linear regressions. In these regressions, we first entered the physician factors as well as physician demographics (age and sex) and then we entered specialty. In the first analysis, after attitudes towards adolescents, attitudes towards smoking cessation, and physician

demographics were accounted for ($R^2 = 0.36$; $P < .001$), specialty was found to be significantly associated with screening of younger adolescents (R^2 change = 0.06; $P < .01$). In the analysis for screening of older adolescents, after attitudes towards adolescents, attitudes towards smoking cessation, and physician demographics were accounted for ($R^2 = 0.42$; $P < .001$), specialty was not found to be a significant correlate of screening behavior (R^2 change = 0.02; $P = .08$).

Discussion

The purpose of this study was to assess reported rates of screening adolescents for smoking and to identify correlates of screening. The screening rates found in this study are likely to be influenced by self-report bias.²³ However, even with some degree of overreporting, the screening rates still fall significantly short of recommendations to ask all adolescents about smoking.^{1,4,11}

Screening rates for smoking in adolescent patients were found to vary significantly among four primary care specialties. Pediatricians, who saw high numbers of adolescents per week and who saw primarily younger adolescents, reported the lowest rates of screening of all four groups. Our results suggest that differences among specialties in beliefs about patient compliance and level of comfort in dealing with adolescent patients may explain the variation in rates of screening among specialties.

In addition, this survey revealed that screening rates vary by type of visit, age of adolescent, and type of cigarette use. These findings indicate that physicians are missing important opportunities to intervene at the onset of smoking during adolescence. First, physicians are not asking about smoking during the age in which adolescents are likely to smoke their first cigarette.²⁴ Physicians screen younger adolescents less often for any type of cigarette use than they screen older teens. Second, physicians were more than twice as likely to ask an adolescent about regular smoking than about ever having tried a cigarette, regardless of the age of the patient. This last finding is worrisome given that interventions designed to stop experimental smoking may be more effective than those targeting regular smoking.²⁵

The generalizability of this study to all primary care physicians in California is limited by the fact that the physicians surveyed do not represent a true probabil-

ity sample of primary care providers because of the sampling design; only board-certified primary care physicians who graduated after 1975 were sampled while non-board-certified physicians and board-certified physicians who graduated before 1975 were not part of the sampling frame. These findings also do not completely describe the care delivered to adolescents in that nurse practitioners and physicians' assistants, who also provide preventive health care to youth, were not sampled in this study. In addition, the validity of our findings with regard to variation in screening by specialty may also be limited if there are specialty-specific biases in self-report of screening behavior; for example, adolescent medicine specialists are more likely to over-report screening practices.

In summary, high levels of comfort with adolescents and with smoking-cessation counseling had a positive influence on screening adolescents for regular smoking. These results are consistent with previous studies that show that training and feelings of competence in smoking cessation increase intervention efforts by physicians.⁶ Improving physicians' skills in smoking cessation, especially those physicians specializing in pediatrics, is likely to have a positive influence on rates of smoking intervention. In addition, all guidelines for physician intervention in smoking should highlight the fact that experimentation with cigarettes begins early in the second decade of life. □

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Cigarette Smoking Attitudes and First Use among Third- through Sixth-Grade Students: The Bogalusa Heart Study

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ABSTRACT

Objectives. This study examined cigarette smoking attitudes, peer and parental influence, and first use among children in southeastern Louisiana.

Methods. Data from 933 children in grades 3 through 6 in the Bogalusa Heart Study (1993 through 1994) were analyzed.

Results. Fifteen percent of the children had tried smoking. Of these, 40% first smoked with a family member, and 46% obtained their first cigarette from a family member or from home. Correlates of ever having smoked were race, sex, having a best friend or family member who smoked, and attitudes that smoking is disgusting and that nonsmokers get better grades.

Conclusions. Prevention programs should begin early and focus on family and peer influences as well as attitudes. (*Am J Public Health.* 1997;87:1345-1348)

Introduction

Child and adolescent smoking continues to be a major public health problem.^{1,2} Numerous studies have examined attitudes and correlates of smoking experimentation and initiation among teenagers.³⁻¹⁴ Few studies, however, have examined attitudes and correlates of smoking in preadolescence—before children regularly smoke, although some may have experimented.^{15,16} Also, few studies have compared attitudes and correlates of smoking among White and Black preadolescent children. Such studies may identify adverse influences that can be targeted for prevention and positive influences (i.e., against smoking) that might be reinforced. Situations of first cigarette use, attitudes about smoking, and correlates of smoking were examined among a biracial cohort of third- through sixth-grade children in a southern community.

Methods

The Bogalusa Heart Study is a long-term investigation of the development of cardiovascular disease beginning in childhood in a semirural, biracial (two-thirds White, one-third Black) community in southeastern Louisiana. Data were collected by trained staff, and parental consent was obtained for examination, as described elsewhere.¹⁷

Private booths were used for answering a tobacco-use questionnaire, which was developed from a social-learning framework.^{18,19} A tape recording of questions was provided for children in grades 3 through 6. Smoking status was categorized as follows:

1. Smoke at least one cigarette per week
2. Used to smoke at least one cigarette per week
3. Tried a few cigarettes but do not smoke now
4. Smoke less than one cigarette per week
5. Never tried cigarettes

For this report, the first four categories were combined to identify those who ever tried cigarettes.

In 1993 and 1994, third- through sixth-grade children completed a questionnaire assessing smoking attitudes/beliefs, family and peer smoking, and situations of first cigarette use (with whom, how obtained, age) (Tables 1 and 2). Of 989

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