

Association of Adolescent Cigar Use With Other High-Risk Behaviors

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ABSTRACT. *Objectives.* To describe the association of cigar use with use of cigarettes, smokeless tobacco, and alcohol among adolescents; and to examine the association of self-esteem, physical activity, and use of tobacco promotional items with cigar use.

Methods. A cross-sectional study of 7104 girls and 5499 boys 10 to 15 years of age in 1997. Data were collected from self-report questionnaires.

Results. The prevalence of cigar use increased with age among both girls and boys. Among 11-year-olds, only 1% of girls and 3% of boys had used a cigar, whereas among 15-year-olds, 11% of girls and 25% of boys had used a cigar. Cigar users were much more likely than nonusers to have experimented with cigarettes (girls, odds ratio [OR]: 23.6; 95% confidence interval [CI]: 17.2–32.3; boys, OR: 21.3; 95% CI: 17.1–26.6), smokeless tobacco (girls, OR: 7.5; 95% CI: 4.5–12.4; boys, OR: 13.0; 95% CI: 9.8–17.4), and alcohol (girls, OR: 6.6; 95% CI: 4.8–9.1; boys, OR: 6.8; 95% CI: 5.3–8.8). There was a strong association between cigar use and binge drinking, especially among boys (girls, OR: 11.6; 95% CI: 7.9–16.9; boys, OR: 34.8; 95% CI: 19.4–62.3). Cigar users reported more hours of weekly physical activity than did nonusers. Additionally, cigar users were more likely to report high social self-esteem and to possess a tobacco promotional item.

Conclusions. Adolescents who use cigars are more likely to use other tobacco products and alcohol, to report high social self-esteem, and to possess tobacco promotional items. Health care professionals and teachers should include cigar use in discussions with adolescents addressing substance use. *Pediatrics* 2000;106(2). URL: <http://www.pediatrics.org/cgi/content/full/106/2/e26>; adolescent, cigar, cigarette, smokeless tobacco, tobacco, alcohol, binge drinking, physical activity, self-esteem.

ABBREVIATIONS. GUTS, Growing Up Today Study; NHS II, Nurses Health Study II; BMI, body mass index; OR, odds ratio; CI, confidence interval.

The United States is currently witnessing an epidemic rise in the use of cigars among adults.¹ Cigar consumption rose 75% between 1993 and 1998, an increase driven primarily by the growing popularity of premium cigars.^{1,2} Among adults, the prevalence of cigar use has risen most dramatically

in adults 18 to 24 years old. Between 1990 and 1996, there was a 3-fold increase among men and a 10-fold increase among women in this age group.³

Trends in cigar use among adolescents are difficult to establish. Before the beginning of this decade, adolescent cigar use was so infrequent that it was not monitored in adolescent high-risk surveillance studies, such as the Youth Risk Behavior Survey⁴ and the Monitoring the Future Project.⁵ Four recent studies have reported the prevalence of cigar use among youth in the United States.^{1,6} Prevalence was lowest in a study conducted among California youth 12 to 17 years old. In that study, nearly 10% of girls and 20% of boys reported having ever smoked a cigar. Prevalence rates were highest in a Massachusetts school-based study, where 24% of girls and 43% of boys in grades 7 through 12 reported ever use of cigars. These rates of cigar use equal or exceed those previously reported for young adults 18 to 24 years old.¹

The current level of adolescent cigar use is of concern for several reasons. First, cigar smoking is associated with significant adverse health effects, including increased risk of chronic obstructive pulmonary disease, coronary heart disease, lung cancer, and oropharyngeal cancers.^{7,8} Therefore, if cigar use during adolescence persists into adulthood, the rates of cigar-related diseases will certainly rise, adding to the burden of tobacco-related illness.^{7,8} Second, adolescent cigar use may increase the likelihood of concomitant use of cigarettes. In addition, cigar use may be associated with other high-risk adolescent behaviors, including smokeless tobacco and alcohol use. Several studies have suggested that cigarette use leads to or is concomitant with other substance use^{9–13}; therefore, the relationship between cigar use and cigarette use is of particular concern. It is not yet clear whether adolescent cigar use serves as a gateway¹⁴ to other substance use or whether it is one of a cluster of high-risk behaviors.

The purpose of the current study was to examine the cross-sectional relationship between adolescent cigar use and the use of cigarettes, smokeless tobacco, and alcohol among boys and girls 10 to 15 years of age. We also wanted to examine how mediating factors, such as self-esteem, physical activity, and exposure to tobacco promotional items, might affect the use of cigars. We hypothesized that cigar use is not only strongly associated with the use of alcohol and other forms of tobacco but is also associated with more serious abuse of these substances. Given that possession of tobacco promotional items

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has been found to be associated with cigarette use,¹⁵ we hypothesized that it would also be positively related to cigar use. Additionally, we hypothesized that like cigarette use,^{16,17} cigar use would be associated with low self-esteem. Attributable to the celebratory nature of cigars and their use in victory celebrations, we anticipated that adolescents involved in sports teams and, therefore, with high levels of physical activity would be more likely to use cigars. Because cigar use is traditionally considered a male activity, we expected there to be differences in patterns of use and associated behaviors among girl and boy cigar users.

METHODS

Established in 1996, the Growing Up Today Study (GUTS) is a longitudinal study of 16 882 adolescents who are children of women participating in the Nurses Health Study II (NHS II). NHS II was established in 1989 and consists of 116 671 female nurses, currently 33 to 51 years old who responded to a mailed questionnaire about their medical history and lifestyle and health behaviors. Follow-up questionnaires were sent to participants in 1991, 1993, and 1995. Additional details have been reported previously.¹⁸

GUTS was established by sending letters to ~40 000 women who participated in NHS II and indicated that they had a child between 9 and 14 years of age. The letter briefly explained the goals of the new study and requested permission from the nurse to contact the child/children. Mothers who gave permission provided each child's name, age, gender, and address. These 25 000 children then were sent a packet including a letter inviting them to participate in a new study and a gender-specific questionnaire. Return of a completed questionnaire was considered consent to participate. This study was approved by the Human Subjects Committees at the Harvard School of Public Health and Brigham and Women's Hospital.

The baseline questionnaire was returned by 9039 girls and 7843 boys. Follow-up questionnaires were mailed in the fall of 1997. Approximately 81% of the girls ($n = 7299$) and 72% of the boys ($n = 5653$) who returned the baseline questionnaire in 1996 completed the follow-up questionnaire in 1997.

Mothers who gave us permission to contact their children were similar to those who did not, with slight differences noted for age (37.7 vs 37.8 years old), current smoking (8% vs 10%), and body mass index (BMI; 25.3 vs 25.7 kg/m²). In addition, mothers of children who actually joined the study were slightly less likely to smoke (8% vs 9%) than were mothers of children who declined to participate.

Measures

Anthropometric Measures

Participants were asked to report their measured height and weight. BMI was included in models that included cigar use and measures of self-esteem to control for potential confounding. Body image is an important determinant of self-esteem and, therefore, BMI and Tanner stage were included in the self-esteem models. Tanner stage has been associated with cigarette use¹⁹ and, therefore, may be potentially related to cigar use as well.

Pubertal development was assessed with drawings of the Tanner stages of development²⁰⁻²² of pubic hair (for girls and boys) and breasts (for girls). Participants were asked to indicate which stage(s) reflected their level of development. Breast and pubic hair development stages were highly correlated (Spearman $\rho = .80$). Therefore, to be parsimonious and comparable (between genders), we used only pubic hair development to measure the stage of pubertal development.

Tobacco Use

Cigar use was assessed only in 1997, when participants were asked whether they had ever smoked a cigar. Cigarette use was assessed in both 1996 and 1997 with questions derived from the Youth Risk Behavior Survey²³ and the California Tobacco Survey.²⁴ In 1996, we asked participants whether they had ever tried

or experimented with cigarette smoking, and in 1997, we asked whether they had done so in the past year. Participants who reported experimentation in either year were classified as ever users and were asked how old they were when they smoked their first whole cigarette. They also were asked to report the number of cigarettes they smoke each day in 1 of 5 categories (1-4, 5-12, 13-24, and ≥ 25). The mean of each number range was used as the value for each category, with the highest category being treated as 25. We also asked participants, regardless of their smoking status, whether they had ever bought or been given items with the name of a cigarette on them.

Smokeless tobacco use was also assessed in 1996 and 1997. In 1996, we asked participants whether they had ever used smokeless tobacco, and in 1997, we asked whether they had done so in the past year. Participants who reported use in either year were classified as ever users.

Peer and Family Smoking Status

We asked participants in 1997 how many of their friends smoked cigarettes (none, one, a few, most, or all) and whether they had a sibling who smoked cigarettes. Because the children participating in GUTS are the offspring of women participating in the NHS II, we were able to determine the mother's smoking status in 1995 by linking NHS II data with GUTS data.

Alcohol Use

We asked participants whether they had ever tried alcohol, and if so, whether they had ever had a whole drink. A whole drink was defined as a whole glass, can, or bottle of beer, a whole glass of wine, a whole mixed drink, or shot of liquor. Participants who reported having a whole drink of alcohol were subsequently asked whether they had ever been drunk, and how many alcoholic beverages they usually consumed at one time. Those who reported drinking ≥ 5 alcoholic beverages at a time were categorized as binge drinkers. All participants were asked how frequently they had ridden with drivers who had been drinking alcohol or taking drugs.

Physical Activity

The instrument used to measure physical activity has been previously validated among adolescents.²⁵ The GUTS survey was slightly modified, so that individuals report, by season, the number of hours per week they spend participating in each of 16 activities. Response categories ranged from 0 to >10 hours per week.

Self-Esteem

Self-esteem questions were based on Harter's Child Self-Perception Survey.²⁶ Based on focus group findings, we modified the wording of items and the response scale so that they would be more comprehensible to children 10 to 15 years old (G. Colditz, personal communication, 1997). Four domains of self-esteem were assessed on the 1997 questionnaire (social, scholastic, athletic, and global), each with a possible score ranging from 1 to 18.

Sample

Participants were excluded from analysis if they provided no information on cigar use (.5% of girls and .9% of boys) or if they were ≤ 9 or ≥ 16 years of age in 1997 (2.2% of girls and 1.9% of boys). The latter group of children was excluded because the number of children in the extreme age groups was too small to analyze. The final sample for analysis included 7104 girls and 5499 boys.

Statistical Analyses

Statistical analyses were performed using SAS (SAS Institute, Cary, NC).²⁷ All analyses were stratified by gender. We calculated the age-adjusted prevalence of tobacco and alcohol use, family and peer smoking, and possession of tobacco promotional items. We also calculated the age-adjusted means for BMI, hours of physical activity per week, and self-esteem. Logistic regression was used to examine the association between other substance use (the outcome) and cigar use. Additional logistic regressions were conducted to examine the association between cigar use and self-esteem and possession of tobacco promotional items. Age- and

gender-specific z scores were calculated for BMI, which was used as a potential confounding variable in these models. Each domain of self-esteem was divided into tertiles, and odds ratios (ORs) were calculated comparing the highest tertile with the lowest. Weekly hours of physical activity was used as a continuous variable in models where it was included as a potential confounding variable. In examining the direct association between cigar use and physical activity in an age-adjusted logistic regression model, physical activity was divided into tertiles to compare the highest level of physical activity with the lowest level.

RESULTS

The sample consisted of 12 603 adolescents 10 to 15 years old (Table 1). There were slightly more girls than boys (56% vs 44%), and the sample was ~94% white, 1% black, 1.5% Hispanic, and 1.5% Asian. This racial distribution reflects the composition of the nursing profession as well as the lower response rate among ethnic/racial minorities to the initial NHS II recruitment letter.

The prevalence of cigar use by age and gender is shown in Fig 1. Overall, 4% of girls and 10% of boys reported having ever smoked a cigar. The prevalence of use increased with age among both girls and boys. For example, only 3% of 11-year-old boys reported cigar use, compared with 25% of 15-year-old boys.

Demographic characteristics of cigar users versus nonusers are presented in Table 2. Among both girls and boys, hours of physical activity seemed to be higher among cigar users than among nonusers. Cigar users also reported more advanced Tanner stage than did nonusers. Cigar users were more likely than nonusers to have a mother who smoked cigarettes, and to report having a sibling or friends who smoked cigarettes. They also were more likely to have bought or been given a tobacco promotional item.

The age-adjusted prevalence rates of cigarette, smokeless tobacco, and alcohol use among cigar users and nonusers are presented in Table 2. Use of these substances was more prevalent among individuals who had smoked a cigar than among those who had not. Boys who had smoked a cigar were more likely than those who had not smoked a cigar to have experimented with cigarettes (60% vs 9%), smokeless tobacco (21% vs 2%), and alcohol (54% vs 20%). Boy

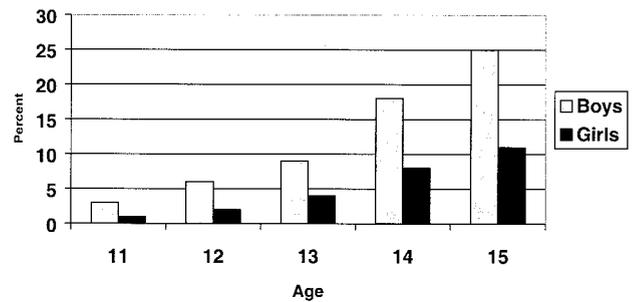


Fig 1. Ever use of cigars by age in GUTS.

cigar users initiated cigarette smoking at a younger age than nonusers (10.9 vs 11.4 years of age). They also smoked more cigarettes per day than nonusers (1.7 vs .8 cigarettes/day). Similar trends were demonstrated among girls.

In Table 3, we present the odds of others substance abuse among cigar users versus nonusers. Adolescents who smoked cigars were at least 20 times more likely to report cigarette use than those who had never used cigars (girls, OR: 23.6; 95% confidence interval [CI]: 17.2–32.3; boys, OR: 21.3; 95% CI: 17.1–26.6). Cigar use was also associated with smokeless tobacco use, although more strongly among boys (OR: 13.0; 95% CI: 9.8–17.4) than among girls (girls, OR: 7.5; 95% CI: 4.5–12.4). Adolescents who had used cigars were more likely to have used alcohol than adolescents who had not used cigars (girls, OR: 6.6; 95% CI: 4.8–9.1; boys, OR: 6.8; 95% CI: 5.3–8.8). Cigar use also was related to binge drinking. This association was stronger among boys (OR: 34.8; 95% CI: 19.4–62.3) than among girls (OR: 11.6; 95% CI: 7.9–16.9). Adolescents who reported having ever used cigars also were more likely to report having been drunk and to report having ever ridden in a car with an intoxicated driver. The associations between cigar use and other substance use, binge drinking, and having been drunk, all remained significant after controlling for use of cigarettes, smokeless tobacco, and alcohol.

We investigated the role of possible mediating factors for cigar use. We hypothesized that self-esteem may influence the decision to use cigars, analogous to the mediating effect that self-esteem plays in the use of cigarettes. To control for potential confounding by cigarette use, ORs were adjusted for cigarette use as well as established predictors of cigarette use. Means and ORs for self-esteem scores are presented in Table 4. Cigar users reported higher social self-esteem scores than did nonusers. Social self-esteem was associated with cigar use among both girls and boys in logistic regression models adjusted for age, BMI, Tanner stage, cigarette use, peer smoking status, sibling smoking status, mother's smoking status, and possession of tobacco promotional items. Girls with high social self-esteem were 50% more likely than were girls with low social self-esteem to use cigars (OR: 1.5; 95% CI: 1.0–2.1). Boys with high social self-esteem were nearly twice as likely to report cigar use as boys with low social self-esteem (OR: 1.9; 95% CI: 1.3–2.6). Among boys, cigar users reported higher athletic self-esteem than

TABLE 1. Distribution of Children in GUTS Cohort in 1997

	Girls	Boys
Total	7104 (56%)	5499 (44%)
Age (y)		
10–11	2189 (31%)	1839 (33%)
12	1421 (20%)	1140 (21%)
13	1324 (18%)	978 (18%)
14	1191 (17%)	901 (16%)
15	979 (14%)	641 (12%)
Race/ethnicity		
White	6627 (93.6%)	5144 (93.7%)
Black	60 (.8%)	40 (.7%)
Hispanic	97 (1.4%)	76 (1.4%)
Asian	104 (1.5%)	79 (1.4%)
Other	190 (2.7%)	148 (2.7%)
Mean BMI (kg/m ²)	19.1 ± 3.6	19.2 ± 3.6
Substance ever use		
Cigars	310 (4%)	530 (10%)
Cigarettes	1085 (15%)	788 (14%)
Chewing tobacco	94 (1%)	251 (5%)
Alcohol	961 (36%)	656 (32%)

TABLE 2. Age-Adjusted Prevalence and Mean Values of Characteristics Among GUTS Adolescent Cigar Users and Nonusers

	Girls		Boys	
	Cigar Never Users (n = 6794)	Cigar Ever Users (n = 310)	Cigar Never Users (n = 4969)	Cigar Ever Users (n = 530)
Mean age (y)	12.6	12.6	12.5	12.5
Mean BMI (kg/m ²)	19.1	19.6	19.1	19.6
Mean physical activity (h/wk)	12.7	15.8	15.8	20.2
Mean Tanner stage	3.6	3.9	3.2	3.5
Use of cigarettes				
Ever use*	13%	62%	9%	60%
Mean age of cigarette initiation (y)	11.5	11.1	11.4	10.9
Number of cigarettes smoked per d	3.1	4.6	.8	1.7
Use of smokeless tobacco				
Ever use†	1%	7%	2%	21%
Use of alcohol				
Ever use‡	25%	60%	20%	54%
Ever been drunk	23%	47%	13%	37%
Ever been in car with intoxicated driver§	2%	6%	2%	9%
Binge drinking	1%	7%	<1%	7%
Mother's cigarette smoking status¶				
Never smoker	70%	62%	69%	61%
Current smoker	7%	13%	7%	11%
Past smoker	22%	25%	23%	28%
Missing	1%	<1%	1%	<1%
Sibling who smokes cigarettes	9%	27%	7%	17%
Friends who smoke cigarettes	4%	25%	2%	13%
Possess tobacco promotional item	11%	26%	15%	27%

* Defined as having ever tried or experimented with cigarette smoking, even a few puffs.

† Defined as reported ever use of chewing tobacco.

‡ Defined as having had a whole drink of alcohol.

§ Defined as riding with a driver who has been drinking alcohol or taking drugs.

|| Defined as drinking 5 or more drinks at 1 time.

¶ Not adjusted for age of child.

TABLE 3. Age-Adjusted OR of Other Substance Use Given Cigar Use Among GUTS Adolescents

Substance Use Behavior	OR of Behavior Given Cigar Use [95% CI]	
	Girls	Boys
Use of cigarettes		
Ever use*	23.6 [17.2–32.3]	21.3 [17.1–26.6]
Use of smokeless tobacco		
Ever use†	7.5 [4.5–12.4]	13.0 [9.8–17.4]
Use of alcohol		
Ever use‡	6.6 [4.8–9.1]	6.8 [5.3–8.8]
Ever been drunk	3.4 [2.5–4.7]	4.1 [2.9–6.0]
Ever ridden in car with intoxicated driver§	4.0 [2.6–6.1]	4.8 [3.2–7.1]
Binge drinking	11.6 [7.9–16.9]	34.8 [19.4–62.3]

* Defined as having ever tried or experimented with cigarette smoking, even a few puffs.

† Defined as reported ever use of chewing tobacco.

‡ Defined as having had a whole drink of alcohol.

§ Defined as riding with a driver who has been drinking alcohol or taking drugs.

|| Defined as drinking 5 or more drinks at 1 time.

did non-users. Boys with high athletic self-esteem were 50% more likely than were boys with low athletic self-esteem to use cigars (OR: 1.5; 95% CI: 1.1–2.1). However, this relationship between cigar use and athletic self-esteem was not seen among girls. Global and scholastic self-esteem scores were not related to cigar use in logistic regression models in either girls or boys.

The association between cigar use and physical activity was significant among both girls and boys in

an age-adjusted logistic regression model that compared high levels of physical activity with low levels (girls, OR: 1.7; 95% CI: 1.2–2.3; boys, OR: 2.3; 95% CI: 1.8–3.0). Among boys, high levels of physical activity remained significant in a full model that included age, BMI, Tanner stage, cigarette use, peer smoking status, sibling smoking status, mother's smoking status, possession of tobacco promotional items, and athletic self-esteem. However, this was not true among girls.

We also examined the relationship between cigarette marketing and the use of cigars. Possession of a tobacco promotional item was significantly associated with cigarette use in both girls and boys, even after adjusting for age, BMI, Tanner stage, physical activity, peer smoking status, sibling smoking status, and maternal smoking status (girls, OR: 2.2; 95% CI: 1.8–2.7; boys, OR: 2.1; 95% CI: 1.7–2.6). Therefore, cigarette use was included in the model examining the relationship between cigar use and tobacco promotional items. Cigar use was related to possession of tobacco promotional items among boys in a model that included the aforementioned variables and cigarette use (OR: 1.4; 95% CI: 1.0–1.8). No significant association between tobacco promotional items and cigar use was observed among girls when these potential confounding variables were adjusted for in the model (OR: 1.2; 95% CI: .8–1.6).

DISCUSSION

Cigar use was associated with other substance use among the adolescent participants of GUTS. Cigar

TABLE 4. Association of Cigar Use With Self-Esteem (Highest Tertile Compared With Lowest Tertile) Scores Among GUTS Adolescents

	Girls			Boys		
	Mean Score*		OR† [95% CI]	Mean Score*		OR† [95% CI]
	Cigar Use No	Cigar Use Yes		Cigar Use No	Cigar Use Yes	
Self-esteem						
Social	14.4	14.8	1.5 [1.0–2.1]	14.4	14.9	1.9 [1.3–2.6]
Athletic	13.0	13.0	1.0 [.7–1.5]	13.8	14.4	1.5 [1.1–2.1]
Global	12.6	11.7	.8 [.5–1.3]	12.9	12.5	1.1 [.8–1.5]
Scholastic	14.9	14.2	.8 [.5–1.1]	14.9	14.4	.9 [.7–1.2]

* Age-adjusted means.

† OR adjusted for age, BMI, Tanner stage, weekly hours of physical activity, cigarette use, friend cigarette use, sibling cigarette use, mother's smoking status, and possession of tobacco promotional items.

users were more likely to smoke cigarettes, use smokeless tobacco, use alcohol, and binge drink than were nonusers. The associations between cigar use and other substance use are similar to those observed in other studies. The Robert Wood Johnson Foundation 1996 National Study of Tobacco Price Sensitivity, Behavior, and Attitudes Among Teenagers showed that both cigarette users and smokeless tobacco users were >3 times more likely than nonusers to report ever having smoked a cigar.⁶ Likewise, the 1996 Massachusetts Department of Public Health study found that high school students who used cigarettes or smokeless tobacco were much more likely to use cigars than were students who did not use cigarettes or smokeless tobacco.⁶ However, these studies did not describe the strong associations between cigar use and more severe forms of alcohol and tobacco abuse that we found.

The strong relationship between cigar use and binge drinking is noteworthy. The high levels of binge drinking among US adolescents show no sign of abatement.²⁸ In 1997, 33% of high school students reported binge drinking (defined as 5 or more drinks at a time) on more than one occasion during the previous 30 days.²⁹ Because binge drinkers are at high risk for adverse health effects, such as injury, alcohol overdose, and unprotected sexual activity,²⁸ the relation of cigar use to binge drinking deserves further examination.

Whether cigar use promotes the use of other forms of tobacco needs to be clarified, as does the contribution of cigar use to the likelihood of nicotine addiction. Cigar users smoked more cigarettes per day and initiated cigarette use at an earlier age than did nonusers of cigars. These data suggest that cigar use may be associated with a higher likelihood of becoming an addicted, regular cigarette smoker. Cigar users also were more likely to own a tobacco promotional item. Several recent studies have shown an association between ownership of and willingness to use tobacco promotional items and use of cigarettes.^{7,15,30} Cigarette merchandising also may be indirectly promoting the use of cigars. Boys who possess a tobacco promotional item are more likely to smoke cigars, even after controlling for cigarette use, suggesting some crossover effect of cigarette marketing to other forms of tobacco use. Adolescents may

be particularly vulnerable to cigarette marketing schemes, which make tobacco users seem confident and cool. These images may promote tobacco use as a way to increase self-esteem and popularity. Cigar users reporting higher social self-esteem than nonusers may suggest that adolescents believe their popularity is linked to their cigar use.

The social networks formed by adolescents involved in sports activities may provide increased opportunities for peer support of cigar use. Those adolescents with high levels of athletic self-esteem may be more involved in team or individual sports that view cigars as a symbol of victory. Because cause and effect relationship cannot be inferred from cross-sectional analyses, one cannot determine whether use of cigars increases self-esteem or whether those with higher self-esteem are more likely to try smoking a cigar.

This study has potential limitations. In addition to the cross-sectional design, which limits causal inference, prevalence of cigar use, as well as other substance use, in the GUTS cohort is lower than that reported in most other studies.^{1,6,31} Prevalence of ever use of cigars among adolescents in other national and state studies has ranged from 13% to 39%,^{1,6,31} whereas among 15-year-old GUTS participants prevalence of cigar use was 11% among girls and 25% among boys. There are several possible explanations for this discrepancy between GUTS data and other estimates. First, the GUTS cohort includes adolescents who are younger than the participants in many other studies, and, therefore, they may not have initiated cigar or other substance use yet. Second, the self-report of cigar use and the use of other substances was not validated in GUTS. Although the questionnaire is mailed directly to the child with an envelope for return, GUTS participants may underreport cigar use for fear that their parents will see their response. The relative anonymity of the school-based setting used in other studies of cigar use may increase the accurate reporting of substance use, or it may lead to overreporting of substance use.

Alternatively, rates of cigar use may actually be lower in the GUTS cohort. There are several potential reasons for this. Adolescents participating in GUTS are of higher than average socioeconomic status, which may put them at lower risk of tobacco use.³²

They are also the sons and daughters of health professionals and may be more health conscious than their peers, although this has never been studied. Additionally, the mothers of GUTS participants smoke much less than women their age in the United States. According to the 1994 National Health Interview Survey, 27.8% of women 25 to 44 years of age report current smoking,³³ whereas only 9.5% of the mothers of children in the GUTS study, who are 32 to 49 years of age, report current smoking. Because the survey was limited to asking a question concerning ever use of cigars, we do not have information on frequency or intensity of cigar use. Also, we do not have data concerning parental, sibling, or peer cigar use, which could be potential factors associated with adolescent cigar use. The influence of exposure to media images of glamorous movie stars and famous athletes smoking cigars is also an important factor to consider, because celebrities often serve as role models for young people. However, we did not collect data to allow examination of these media influences.

Among GUTS adolescents, cigar users were more likely to have a mother who was a current smoker than were nonusers (among girls, 13% vs 7%; among boys, 11% vs 7%). Because parental smoking is an important predictor of adolescent cigarette smoking,³⁴⁻³⁷ it would not be surprising if parental cigarette use was also a determinant of adolescent cigar use.

CONCLUSION

Cigar use among adolescents seems to be a new trend.¹ We found that cigar use is not an isolated activity but is highly associated with other forms of substance use, including use of cigarettes, smokeless tobacco, and alcohol. Further investigation is warranted to establish long-term factors that predispose to adolescent cigar use and to determine whether cigar use is a gateway to other substance use. Follow-up of adolescent cigar users is necessary to understand the implications of adolescent cigar use on subsequent adverse health behaviors and adverse health consequences.

Although the National Cancer Institute has created guidelines for physicians to counsel children and adolescents about tobacco use,³⁸ a recent study by the Tobacco Research and Treatment Center in Boston concluded that <2% of physicians counsel adolescents about smoking.³⁹ Physician counseling has been shown to be effective in promoting smoking cessation and prevention in adults,⁴⁰⁻⁴² and it follows that counseling in a health care setting might also be effective in young people. As cigar use is a recently established youth behavior, health professionals should explicitly inquire about cigar use and should be aware that adolescents who are using cigars are likely to be using other substances. Physician-based interventions addressing cigar use and its link to other substance use should be vigorously tested.

Our investigation of possible mediating factors suggests several topics that might be included in adolescent intervention programs. Adolescents with higher levels of social self-esteem and physical activ-

ity are probably influenced by exposure to fashionable media images of cigar use. These media images also may contribute to adolescent attraction to tobacco promotional items. Exposure to images of movie stars and famous athletes smoking cigars in celebratory scenes may lure adolescents into using cigars to mimic these adults. Celebrities should be aware that appearing in public with cigars could potentially influence adolescents who view them as role models. The public health community should put pressure on public figures not to promote cigar use in this way. Teachers and health care professionals should help young people to deconstruct media images glamorizing tobacco products and assist them in responding to social pressures from peers.

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