

Sexual Orientation and Tobacco Use in a Cohort Study of US Adolescent Girls and Boys

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Objective: To examine sexual-orientation group disparities in tobacco use in adolescent girls and boys.

Design: Survey data from 10685 adolescent girls and boys participating in 1999 in the Growing Up Today Study were examined cross-sectionally.

Setting: Community-based population of adolescents living throughout the United States.

Main Outcome Measure: Prevalence of tobacco use.

Results: Ninety-two percent of the participants described themselves as heterosexual (n=9296), 5% as mostly heterosexual (n=511), 1% as lesbian/gay/bisexual (n=103), and 2% as unsure (n=226). Ages

ranged from 12 to 17 years. Compared with heterosexuals, mostly heterosexual girls were 2.5 (95% confidence interval, 1.8-3.5), lesbian/bisexual girls were 9.7 (95% confidence interval, 5.1-18.4), and mostly heterosexual boys were 2.5 (95% confidence interval, 1.4-4.6) times more likely to smoke at least weekly. In contrast, gay/bisexual boys were not more likely to smoke. Findings persisted even when controlling for multiple sociodemographic and psychosocial covariates.

Conclusion: Our findings indicate that mostly heterosexual adolescents of both sexes and lesbian/bisexual girls are at heightened risk for tobacco use.

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TOBACCO USE IS AMONG THE most critical public health issues affecting lesbian/gay/bisexual (LGB) communities.^{1,2} Among LGB adults, tobacco use exceeds that of heterosexual women³⁻⁶ and men.⁷ Studies conducted through community centers serving LGB youth have found elevated rates of tobacco use compared with their heterosexual peers.^{8,9} Estimates from statewide, school-based surveys in Massachusetts and 1 national survey have varied depending on how sexual orientation was measured. In the 1993 Massachusetts Youth Risk Behavior Survey administered in high schools across the state, tobacco use did not differ significantly between students reporting any same-sex sexual contact and those reporting exclusively other-sex sexual contact.¹⁰ In 1995, when a question on self-identification of sexual orientation was added to the Massachusetts Youth Risk Behavior Survey, significant differences were found, with 59% of the LGB-identified students compared with 35% of the heterosexual students reporting smoking in the previous month.¹¹ The Na-

tional Longitudinal Study of Adolescent Health found that compared with girls and boys with other-sex attractions only, those with romantic attractions to both sexes reported smoking more cigarettes in the previous month, whereas those with only same-sex attractions did not smoke more cigarettes.¹²

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Several mechanisms have been hypothesized to explain why sexual orientation may be associated with tobacco use. Antigay stigma and harassment, including social isolation; rejection from family, friends, and peers; discrimination; emotional abuse; and physical violence¹³⁻¹⁵ create a hostile environment for adolescents coming to terms with same-sex attractions. Researchers have proposed that resultant depressive symptoms, stress, and low self-esteem may render some sexual minority adolescents more vulnerable to tobacco use.^{1,2,14-17} Another hypothesized mechanism points to the tobacco industry's targeted marketing to LGB commu-

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nities.¹⁸⁻²⁰ Little research has examined whether and how much these factors may underlie sexual-orientation group disparities in adolescent tobacco use.

Prior research has found adolescent tobacco use to be associated with age,^{21,22} race/ethnicity,^{22,23} maturational stage,²⁴ smoking by family members,^{25,26} depression,^{22,27} self-esteem,²² weight concerns and dieting,²⁸⁻³⁰ region of residence,²⁶ and use of tobacco industry promotional items.^{31,32} The Growing Up Today Study (GUTS), the longitudinal cohort study of adolescents on which the present analysis is based, has found tobacco use to be positively associated with age, maturational stage, weight concerns, dieting, mother's and sibling's smoking, and high social and athletic self-esteem.^{29,33} It is unknown whether these factors may contribute to sexual-orientation group disparities in tobacco use.

Finally, because LGB sexual orientations are stigmatized in our society, respondents who experience same-sex attractions may be more likely to report that they are unsure of their sexual orientation or to skip the orientation item on the survey. Little research has explored this potential source of misclassification.

We undertook analyses using a large cohort of US adolescents to further understand the sexual-orientation differences in the distribution of tobacco use and dependence and the determinants of these disparities in adolescence. The aims of this analysis were (1) to compare the prevalence of tobacco use and severity of dependence associated with sexual orientation in adolescent girls and boys, including those who are unsure of and who do not disclose their orientation, and (2) to determine whether depressive symptoms, self-esteem, or other factors contribute to sexual-orientation group disparities in tobacco use and dependence.

METHODS

STUDY PARTICIPANTS AND DESIGN

The GUTS was established in 1996 to assess health behaviors in adolescence.³⁴ Women from the ongoing Nurses' Health Study II³⁵ who had children ages 9 to 14 years were asked if they would be willing to enroll their children in the adolescent cohort. In October 1996 letters and baseline questionnaires were mailed to the 13261 girls and 13504 boys whose mothers had granted consent to invite them to participate in GUTS. The invitation letter to the child explained the study and asked them to complete the survey if they wished to participate. Approximately 68% of the girls (n=9039) and 58% of the boys (n=7843) returned completed questionnaires, thereby assenting to participate in the cohort. Follow-up questionnaires have been mailed annually. The GUTS cohort is 93.3% white, 2.2% other races/ethnicities, 1.5% Asian, 1.5% Hispanic, 0.9% African American, and 0.8% Native American. Comparing mothers who allowed us to invite their children to participate in GUTS with those mothers who did not, there were slight differences in the mother's body mass index (25.3 kg/m² vs 25.7 kg/m²), age (37.7 years vs 37.8 years), and smoking rates (8% vs 10%).³⁶ A detailed description of the GUTS methods is provided in Field et al.³⁴ This study was approved by the institutional review boards at the Harvard School of Public Health, Brigham and Women's Hospital, and Children's Hospital, Boston, Mass.

In the fall of 1999, a sexual-orientation question was added to the GUTS survey mailed to all participants. The item was adapted from the Minnesota Adolescent Health Survey³⁷ and asked about feelings of attraction using the following 6 mutually exclusive response options: "Which one of the following best describes your feelings? (1) Completely heterosexual (attracted to persons of the opposite sex), (2) mostly heterosexual, (3) bisexual (equally attracted to men and women), (4) mostly homosexual, (5) completely homosexual (gay/lesbian, attracted to persons of the same sex), or (6) not sure."

Based on responses to the sexual-orientation item, participants were categorized as heterosexual, mostly heterosexual (MH), LGB, unsure, and missing information on sexual orientation. Participants who chose the response options bisexual, mostly homosexual, or completely homosexual were combined to create an LGB category, as the number of participants in each of these categories was insufficient to analyze separately. A short-form version of the 1999 GUTS survey was sent to adolescents who had not responded after 2 mailings of the long-form version. The short-form version excluded the sexual-orientation item.

There were 32 tobacco-related items on the 1999 GUTS survey, adapted from the Massachusetts 1992 Youth Risk Behavior Survey³⁸ and the California Tobacco Control Program survey.³⁹ Participants were asked if they had ever tried cigarettes, if they intended to smoke in the next year, if they had smoked in the past month, and how frequently they had smoked in the past year. Severity of dependence was measured using the Stanford Dependence Index, which is composed of 5 items.⁴⁰ Scores on the index range from 5 to 25, where a high score indicates greater dependence. Participants were asked about their willingness to use tobacco promotional items, such as hats, T-shirts, and bags. They were also asked about the smoking habits of family members and peers.

Pubertal development was assessed with drawings of the Tanner stages of development and scored from 1 to 5, with 5 representing fully mature. Self-assessment of maturation has been validated with adolescents.⁴¹ Participants were asked to provide sociodemographic information, including age, sex, race/ethnicity, and region of residence in the United States.

Measurements of depressive symptoms and weight concerns were adapted from the McKnight Risk Factor Survey, which has been validated among adolescents.⁴² Depressive symptoms were assessed using a 6-item scale that ranges from 6 to 30. Weight concerns were estimated as the mean score of 3 items, and ranged from 1 (least concerned) to 5 (most concerned). Dieting was defined as a report of dieting once a month or more often in the past year. To assess self-esteem, we used a modified version of the Harter Self-Perception Profile for Children.⁴³ We used 4 domains of the scale: social acceptance, scholastic competence, athletic competence, and global self-worth. Each of the 4 self-esteem variables was modeled using tertile indicator terms representing the lowest, middle, and highest thirds of the range of scores observed in the cohort.

STATISTICAL ANALYSIS

Univariate and multivariate regression analyses were conducted using the SAS statistical package⁴⁴ to compare frequencies and means for tobacco use variables across sexual-orientation groups. Analyses were conducted cross-sectionally using data gathered in 1999. Preliminary analyses showed that sexual-orientation groups in the GUTS cohort differ in age; therefore, frequencies for binary variables and means for continuous variables were estimated using an SAS macro that produces age-standardized estimates.

Covariates that may confound or explain associations between sexual orientation and tobacco outcome variables were examined. Tested sociodemographic covariates included age, Tanner stage, race/ethnicity, and region of residence in the United States. Tested psychosocial covariates included depressive symptoms, self-esteem, dieting, weight concerns, and father's, mother's, and sibling's smoking habits. Multivariate regression modeling, using logistic or linear regression methods where appropriate, was used to examine differences in tobacco-related dependent variables across sexual-orientation groups, accounting for effects of these covariates. Generalized Estimating Equation statistical methods were used in regression analyses to account for intracluster correlation resulting from sibling groups in the cohort.⁴⁵ Separate models were examined for girls and boys, and heterosexuals served as the reference group. Analyses excluded 1539 adolescents who responded only to the short-form version of the 1999 GUTS survey. An additional 158 adolescents who reported ages younger than 12 years or older than 17 years in 1999 were excluded from the study.

RESULTS

In 1999, 10685 male and female participants responded to the GUTS survey, 63% of the original cohort. Among the 10136 who answered the sexual-orientation item, 92% of respondents described themselves as heterosexual (n=9296), 5% as MH (n=511), 1% as LGB (n=103), and 2% as unsure (n=226). Participants were 12 to 17 years old, and 93% were white. Compared with heterosexuals, MH and LGB adolescents were significantly older and adolescents unsure of their sexual orientation or missing information on orientation were significantly younger. Four percent (225) of the girls and 7% (324) of the boys did not answer the sexual-orientation item.

The **Table** lists age-standardized prevalence estimates for tobacco use variables and mean scores on the Stanford Dependence Index for girls and boys in each of the sexual-orientation groups, including those who did not answer the orientation question (called "Missing Sexual Orientation" in the Table). The Table also displays multivariate odds ratios and linear regression estimates, controlling for sociodemographic covariates (age, Tanner stage, race/ethnicity, and region of residence). Among girls, large disparities were observed in tobacco use and dependence across sexual-orientation groups; while among boys, differences were observed primarily between MH and heterosexual boys.

Mostly heterosexual girls experienced approximately 2.5 times the odds of that of heterosexual girls on most of the tobacco-related variables, and they were 60% more likely to say they would be willing to use tobacco promotional items. The mean tobacco dependence score for MH girls was almost 1 point higher than that for heterosexual girls. For lesbian/bisexual (LB) girls, the differences were even greater. Lesbian/bisexual girls were more than 6 times more likely to have smoked in the past month and almost 10 times more likely to have smoked at least weekly in the past year, compared with heterosexual girls. Lesbian/bisexual girls were almost 5 times more likely to say that most or all of their friends smoke tobacco, and their mean tobacco dependence score was 2.6 points higher than that of heterosexual girls. Girls unsure of their sexual orientation were half as likely to

have ever smoked tobacco and to say they were willing to use tobacco promotional items compared with heterosexual girls. There were no significant differences between girls missing information on sexual orientation and heterosexual girls.

Similar to their female counterparts, MH boys were about twice as likely to report most of the tobacco use behaviors compared with heterosexual boys. In contrast, gay/bisexual (GB) boys scored 1.5 points lower than heterosexual boys on the index of tobacco dependence. Boys unsure of their sexual orientation were not significantly different from heterosexual boys, while boys missing data on sexual orientation differed on several behaviors.

To assess whether psychosocial factors (depressive symptoms, self-esteem, dieting, weight concerns, and father's, mother's, and sibling's smoking habits) may explain sexual-orientation group differences in tobacco outcomes, these covariates were entered into multivariate models that also adjusted for sociodemographic factors. In most cases, the magnitude of associations between sexual orientation and tobacco use estimated in sociodemographic models was reduced by only about 10% and statistical significance was not changed upon the addition of psychosocial covariates. Data not shown.

COMMENT

To our knowledge, this study is one of the first to examine the association between sexual orientation and tobacco use and dependence in a nationwide sample of adolescent girls and boys. Compared with heterosexual adolescents, both girls and boys who described their feelings as MH had significantly greater odds of ever having tried cigarettes, intending to smoke in the next year, smoking in the past month, and smoking at least weekly compared with their same-sex heterosexual peers. Among the MH adolescents, the magnitude of elevated risk was similar for girls and boys. Among LGB study participants, however, girls and boys did not show similar trends. Lesbian/bisexual girls had significantly greater odds of having tried cigarettes, intending to smoke in the next year, smoking in the past month, smoking at least weekly, and having friends who smoke, and they reported greater dependence on tobacco, compared with heterosexual girls. In contrast, GB boys had significantly lower tobacco dependence scores compared with heterosexual boys.

Our results are consistent with those of most other studies on sexual orientation and tobacco use among women. Studies with adult women³⁻⁶ and adolescent girls⁸ have found lesbians and bisexuals or those with same-sex attractions or partners to have higher rates of smoking than heterosexual females. Our findings indicate that elevated rates of tobacco use observed among adult LB women begin in adolescence.

Several studies with adult men⁷ and adolescent boys^{8,9} have found GB males to report greater tobacco use than heterosexual males. Results from other studies have been conflicting. One found no difference in tobacco use comparing youth with any same-sex sexual contact to those with only other-sex sexual contact,¹⁰ and one found high rates of tobacco use among youth who identified as LGB compared with heterosexuals.¹¹ Using data from the Na-

Age-Standardized Prevalence Estimates, Age-Standardized Means, and Multivariate Odds Ratios and Linear Regression Coefficients for Tobacco Use and Dependence by Sexual Orientation Group, Adjusted for Sociodemographic Covariates, in a Cohort of 10 685 US Adolescent Girls and Boys*

Dependent Variable	Girls									
	Heterosexual (n = 5475)†		Mostly Heterosexual (n = 369)†		Lesbian/Bisexual (n = 62)†		Unsure (n = 143)†		Missing Sexual Orientation (n = 225)†	
	% of Respondents	OR (95% CI)‡	% of Respondents	OR (95% CI)‡	% of Respondents	OR (95% CI)‡	% of Respondents	OR (95% CI)‡	% of Respondents	OR (95% CI)‡
Those who ever smoked tobacco	24.6	1.0 (R)	49.5	2.5 (2.0-3.1)	67.8	5.2 (3.1-9.0)	7.7	0.4 (0.2-0.8)	20.0	1.0 (0.7-1.5)
Those who intended to smoke in the next year	20.8	1.0 (R)	44.6	2.6 (2.1-3.3)	55.0	4.3 (2.6-7.2)	8.4	0.6 (0.3-1.1)	21.8	1.3 (0.9-1.9)
Those who smoked in the past month	9.3	1.0 (R)	25.8	2.7 (2.0-3.5)	42.9	6.3 (3.4-11.6)	3.5	0.6 (0.2-2.0)	7.2	1.1 (0.6-1.9)
Those who smoked at least weekly	5.7	1.0 (R)	15.9	2.5 (1.8-3.5)	38.7	9.7 (5.1-18.4)	1.4	0.4 (0.1-2.6)	4.4	1.2 (0.6-2.4)
Most or all of their friends smoke tobacco	8.0	1.0 (R)	18.4	2.0 (1.4-2.7)	33.9	4.7 (2.6-8.2)	3.5	1.2 (0.5-3.1)	6.7	1.0 (0.5-1.9)
Those who were willing to use tobacco promotional items	22.8	1.0 (R)	35.5	1.6 (1.3-2.0)	35.7	1.6 (0.9-2.8)	10.5	0.5 (0.3-0.9)	21.0	0.9 (0.6-1.4)
	Mean		Mean/β (SE β)/P§		Mean/β (SE β)/P§		Mean/β (SE β)/P§		Mean/β (SE β)/P§	
Tobacco dependence score	8.1 (R)		9.2/0.9 (0.4)/<.05		11.5/2.6 (0.8)/<.001		NA¶/NA		7.7/-0.6 (0.6)/.40	

Dependent Variable	Boys									
	Heterosexual (n = 3821)†		Mostly Heterosexual (n = 142)†		Gay/Bisexual (n = 41)†		Unsure (n = 83)†		Missing Sexual Orientation (n = 324)†	
	% of Respondents	OR (95% CI)‡	% of Respondents	OR (95% CI)‡	% of Respondents	OR (95% CI)‡	% of Respondents	OR (95% CI)‡	% of Respondents	OR (95% CI)‡
Those who ever smoked tobacco	23.5	1.0 (R)	39.9	1.8 (1.2-2.7)	43.9	1.6 (0.8-3.3)	6.2	0.3 (0.1-1.0)	11.0	0.5 (0.4-0.8)
Those who intended to smoke in the next year	19.0	1.0 (R)	34.5	2.1 (1.4-3.2)	34.1	1.6 (0.8-3.2)	7.3	0.7 (0.3-1.6)	9.7	0.6 (0.4-0.8)
Those who smoked in the past month	8.2	1.0 (R)	17.4	2.3 (1.4-3.9)	14.6	1.0 (0.4-2.7)	2.5	0.7 (0.2-3.0)	3.8	0.6 (0.3-1.2)
Those who smoked at least weekly	4.3	1.0 (R)	10.2	2.5 (1.4-4.6)	9.8	1.2 (0.4-4.2)	2.5	1.5 (0.3-6.6)	3.2	1.1 (0.6-2.3)
Most or all of their friends smoke tobacco	6.0	1.0 (R)	8.6	1.5 (0.8-2.9)	7.3	0.6 (0.1-2.4)	1.2	0.5 (0.1-3.8)	3.1	0.9 (0.4-1.7)
Those who were willing to use tobacco promotional items	33.8	1.0 (R)	39.4	1.4 (1.0-1.9)	30.2	0.8 (0.4-1.5)	21.9	0.9 (0.5-1.6)	27.2	0.8 (0.6-1.1)
	Mean		Mean/β (SE β)/P§		Mean/β (SE β)/P§		Mean/β (SE β)/P§		Mean/β (SE β)/P§	
Tobacco dependence score	8.3 (R)		8.5/0.4 (0.5)/.40		8.2/-1.5 (0.6)/<.05		NA¶/NA		12.2/4.2 (1.2)/<.001	

Abbreviations: β, β coefficient; CI, confidence interval; NA, not applicable; OR, odds ratio; (R), reference.

*Boldfaced values indicate statistical significance.

†Maximum sample size; sample size varied because of missing data.

‡Regression models adjusted for age, Tanner stage, race/ethnicity, and region of residence (Northeast, South, Midwest, and West).

§Linear regression estimate (standard error) and P value. Regression models adjusted for age, Tanner stage, race/ethnicity, and region of residence (Northeast, South, Midwest, and West).

||Restricted to adolescents who reported smoking in the past year.

¶Insufficient data, that is, estimates are not reported in the table when 5 or fewer study participants provided data for variable.

tional Longitudinal Study of Adolescent Health, Russell et al¹² found elevated tobacco use among males and females with attractions to both sexes, but not among males and females with only same-sex attractions, compared with youth with only other-sex attractions. Among boys in our sample, we found MH, but not GB, males to re-

port elevated rates of tobacco use. Further study is needed to understand what factors may be protecting GB boys in our cohort from tobacco use in a way not experienced by MH boys and girls and LB girls.

Our findings add to the literature in several important ways. Our study was novel in that we were able to

examine a number of factors that have been proposed to explain why sexual orientation is associated with tobacco use. Interestingly, we found that in cross-sectional analyses, sexual-orientation group disparities in tobacco use persist even when accounting for multiple factors thought to underlie differences in tobacco use. Disparities in tobacco use observed in models controlling for sociodemographic factors were diminished only slightly when considering hypothesized psychosocial determinants of sexual-orientation group differences. Depressive symptoms, self-esteem, dieting, weight concerns, and father's, mother's, and sibling's smoking habits accounted for little of the additional variance in tobacco-related outcomes when added to sociodemographic models. Our findings can be interpreted in at least 2 ways. One, the tested psychosocial factors may explain little of the sexual-orientation group disparities in tobacco use and dependence and other unmeasured factors are contributing to sexual-orientation group differences. Consistent with our results, Gruskin et al⁵ found in a large study of adult women that when controlling for educational level, race/ethnicity, stress, and depressive symptoms in multivariate models, LB women ages 20 to 34 years were more than 3 times more likely to smoke tobacco compared with heterosexual women. Two, the tested psychosocial factors may be important, but they may have their greatest effect on risk at ages younger than those observed in our analyses.

Researchers examining advertising and product promotion practices of the tobacco industry report concentrated targeted marketing to LGB communities and have proposed that this may contribute to elevated smoking rates among sexual minority youth.¹⁸⁻²⁰ In our study, we were able to measure participants' receptivity to tobacco promotional items and found that MH girls were 60% more likely than heterosexual girls to say they were willing to use merchandise branded with cigarette logos. Lesbian/bisexual girls and MH boys showed a similar trend but the differences were marginal ($P < .10$).

To our knowledge, our study identified for the first time adolescent girls and boys who describe themselves as MH as a group at elevated risk for tobacco use and dependence. Prior research has not explored the unique experience of these adolescents, which in our cohort made up 6% of girls and 4% of boys. They may feel isolated from their heterosexual peers because of having same-sex feelings in a stigmatizing environment, which could have negative psychosocial consequences making them more vulnerable to tobacco use. More research will be needed to understand who these adolescents are and what is contributing to their elevated risk.

We were able to explore the sociodemographic characteristics and tobacco use and dependence patterns of adolescents who were unsure of their sexual orientation and who skipped the sexual-orientation item. We found girls and boys describing themselves as unsure of their sexual orientation were the youngest, least advanced in maturational stage, and bore little resemblance to LGB respondents on tobacco outcome variables. These findings suggest that young people in early and middle adolescence who describe themselves as unsure of their sexual orientation or who skip survey questions on sexual ori-

What This Study Adds

Tobacco use and sexual-orientation group disparities in health are areas of priority public health concern for the health of adolescents. This study reports the results of quantitative analyses examining sexual-orientation group disparities in tobacco use and addiction in the GUTS, a longitudinal cohort study of more than 16 000 adolescents. Our analyses documented elevated rates of tobacco use among LB girls compared with heterosexual girls, but lower tobacco dependence scores in GB boys compared with heterosexual boys. We also found elevated rates of tobacco use among adolescents with attractions to both sexes who describe their orientation as MH, a group making up 5% of our cohort. In multivariate models, we found sexual-orientation group disparities in tobacco use persisted even when controlling for multiple sociodemographic and psychosocial factors.

entation are not primarily made up of LGB adolescents who chose not to disclose their orientation. Our findings are consistent with other studies.^{11,12}

This study has several limitations. The GUTS cohort is not a random sample of all US adolescents, and participants are children of nurses. As a result, generalizability may be limited, but confounding by socioeconomic status may also be reduced. Importantly, however, GUTS participants were not enrolled on the basis of sexual orientation, which effectively eliminates the type of enrollment bias that affects samples drawn from LGB organizations, service centers, social events, or other gatherings. Analyses reported in this article are cross-sectional, limiting our ability to make causal inference.

The number of adolescents of color participating in the GUTS cohort is small, and, as a result, we did not have adequate statistical power to assess racial/ethnic differences within sexual-orientation groups. For this reason, results may not be generalizable to adolescents of color. In addition, because of the small sample size in each of the subcategories bisexual, mostly homosexual, and completely homosexual, we had to combine information across these groups into a single orientation category (LGB).

CONCLUSIONS

Our study identified MH adolescents of both sexes and LB girls at heightened risk for tobacco use and dependence. Sexual-orientation group disparities persisted even when accounting for multiple factors that have been proposed to explain differences in tobacco use and dependence. Prospective research is needed to understand the determinants of sexual-orientation group disparities.

The high prevalence of tobacco use and high level of tobacco dependence among LB girls is concerning. Almost 40% of the LB girls reported smoking at least weekly compared with only 6% of heterosexual girls in our study. A recent longitudinal study of early adolescent tobacco use suggests that symptoms of dependence appear early in the process of adoption of smoking tobacco, with over half of the adolescents in the study experiencing symptoms of dependence by the time they were smoking as

little as 2 cigarettes per week.⁴⁶ DiFranza et al⁴⁶ also found that adolescents who reported any of the 11 symptoms of dependence under study, compared with those without symptoms of dependence, had 44 times the odds of being current smokers by the end of the 30-month study. Given the frequency of smoking and the comparatively high scores on the dependence index, it is unlikely that LB girls in our study are simply experimental or casual tobacco smokers. Our findings indicate that these girls are likely to be addicted to tobacco or are quickly moving toward addiction. The development and dissemination of effective tobacco prevention and cessation initiatives for LB adolescent girls and women is both urgent and imperative.

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