

High School Seniors' Smoking Initiation and Progression 1 Year After Graduation

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We explored cigarette smoking prevalence rates in former high school seniors 1 year after graduation and found that among 12th grade never smokers, 25% initiated smoking, and among 12th grade ever smokers, 39% increased their cigarette use. Alcohol use in 12th grade, along with not attending college, were both positively related to smoking progression. Risk for smoking initiation does not end at adolescence, and the public health community must continue tobacco control initiatives throughout adolescence and young adulthood. (*Am J Public Health*. 2007;97:1397–1398. doi:10.2105/AJPH.2006.094235)

In 2000, lifetime and 30-day prevalence rates of smoking among college students were 53% and 29%, respectively.¹ Some young adults become regular smokers for the first time during college²: as many as 37% initiate smoking and 25% progress in their habit.³ Other reports also suggest young adulthood is a time of smoking risk,^{4–6} but initiation and progression risk factors are unclear. Because risk factor identification is key to tobacco control efforts,⁷ we explored factors related to change in smoking prevalence among high school seniors 1 year after completion of 12th grade. We assumed that the developmental period of adolescence transitioning into young adulthood remains a period of risk for smoking^{8,9} and initiation and progression are observable within this period.^{10,11} We hypothesized that social and behavioral risk factors for initiation and progression could be identified.

METHODS

Data were collected through a series of investigations of biobehavioral predictors of adolescent and young adult changes in smoking over time: the Georgetown Adolescent Tobacco Research Project and the Adult Longitudinal Outcomes and Health Assessment, whose methods are described elsewhere.^{12,13} Briefly, a cohort of more than 1100 ninth-grade students was amassed in 1999 and interviewed at least annually in person (1999 to spring 2003) and by telephone (spring 2004 to the present). Annual response rates ranged from 89% to 96%, and the integrity of the cohort and data were high. The primary dependent variable was self-reported smoking status: frequency and intensity of lifetime (ever) and current (past 30-day) cigarette use.⁷ For this analysis, independent variables included gender, race (White vs non-White), college attendance after completing high school, intensity of exposure to best friends who smoked cigarettes in 12th grade (0 or 1 vs 2 or more), and alcohol use in the past 30 days in 12th grade (yes vs no).

A 6-level, ordered categorical variable of smoking behavior in 12th grade was created: 0, never smoker (never smoked a partial or whole cigarette in lifetime); 1, puffer (ever smoked a partial but not whole cigarette, but not within the past 30 days); 2, noncurrent smoker (ever smoked a whole cigarette, but not within the past 30 days); 3, current smoker (smoked a partial cigarette or 1 whole cigarette within the past 30 days); 4, current frequent smoker (smoked 2–19 whole cigarettes within the past 30 days); 5, heavy smoker (smoked 10 or more whole cigarettes within the past 7 days).^{14–16} These categories were replicated 1 year later.

Of 821 12th graders, students who had never smoked by 12th grade (never smokers, $n=404$, or 49% of 12th graders) were selected for analysis, as were students who had ever smoked by 12th grade (ever smokers, including puffers, noncurrent smokers, current smokers, and current frequent smokers, $n=386$, or 47% of 12th graders). Participants who were already heavy smokers in 12th grade ($n=31$) were excluded

TABLE 1—Sample Characteristics: Georgetown Adolescent Tobacco Research Project and the Adult Longitudinal Outcomes and Health Assessment, 1994–2004

	Initiation ^a ($n=404$)	Progression ^b ($n=386$)
Current age, mean (SD)	18.91 (.45)	18.98 (.48)
Gender, no. (%)		
Male	176 (44)	186 (48)
Female	228 (56)	200 (52)
Race, no. (%)		
White	285 (71)	248 (64)
Non-White	119 (29)	138 (36)
College attendance, no. (%)		
Yes	378 (94)	328 (85)
No	26 (6)	58 (15)
Best friends smoking, no. (%)		
< 2	338 (84)	217 (55)
≥ 2	66 (16)	169 (45)
Alcohol use, ^c no. (%)		
Yes	113 (28)	257 (33)
No	291 (72)	129 (67)

^aInitiation included all respondents who had ever smoked even a puff off a cigarette in the year after high school.

^bProgression included respondents who smoked more frequently or intensely over time.

^cAlcohol use was measured as having used alcohol in the past 30 days in 12th grade (yes vs no).

from all analyses. Rates of initiation and progression and associated factors were examined at the bivariate ($P<.10$) and multivariate levels ($P<.05$).¹⁷ Initiation included ever having smoked even a puff off a cigarette since the last interview; progression included smoking more frequently or intensely over time.^{18,19}

RESULTS

Participant characteristics are in Table 1. Among 12th grade never smokers, 25% (101 of 404) initiated smoking after 12th grade. Among eligible 12th grade ever smokers, 39% (152 of 386) progressed after 12th grade.

More intense exposure to friends who smoked in 12th grade ($\chi^2=2.97$; $df=1$; $P=.09$) and alcohol use in the 12th grade within the past 30 days ($\chi^2=7.57$; $df=1$;

$P=.001$) were associated with initiation after 12th grade. Female gender ($\chi^2=3.44$; $df=1$; $P=.06$) and not attending college ($\chi^2=5.21$, $df=1$, $P=.02$) were positively associated with progression after 12th grade.

In multivariate analyses, alcohol use in the 12th grade remained a significant predictor of starting smoking (odds ratio [OR]=1.82; 95% confidence interval [CI]=1.10, 3.0) after we controlled for the effect of exposure to 12th grade friends who smoked (OR=1.34; 95% CI=0.73, 2.44). College nonattendance remained a significant predictor of progression (OR=1.87; 95% CI=1.05, 3.33) after we controlled for the effect of female gender (OR=1.45; 95% CI=0.94, 2.19).

DISCUSSION

Twenty-five percent of participants who had never smoked prior to completing high school went on to try their first cigarette in the following year. Among participants who had ever smoked, 39% progressed to a more advanced smoking habit after 12th grade. Never smokers who were current alcohol users in 12th grade were twice as likely than others to initiate smoking. This suggests that risk for later smoking is increased among nonsmoking students who drink alcohol. This observation might be attributable to the social environment in which drinking and smoking take place²⁰ and to the increasing influence of peers in alcohol and tobacco use over time.^{21,22} Not attending college brought about more intense and frequent smoking, possibly because of increased tobacco advertising directed to this population and difficulties reaching young adults with smoking prevention and intervention messages when they are not in school.²³

Our data provide evidence that risk for smoking continues beyond high school and that alcohol use by senior year and not attending college play a role. The public health challenge is to better address cigarette smoking and alcohol use at the high school and post-high school levels and to continue to address these problems outside educational environments. ■

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Contributors

K.P. Tercyak supervised all aspects of the study and its implementation and led the writing. D. Rodriguez completed the analyses. J. Audrain-McGovern originated the study. All authors contributed ideas, synthesized analyses, interpreted findings, and contributed to writing and editing.

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Human Participant Protection

This research was approved by the Georgetown University and University of Pennsylvania institutional review boards.

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