

Quit Attempts and Intention to Quit Cigarette Smoking Among Young Adults in the United States

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Tobacco causes cancer, heart disease, and stroke in older adults.¹ However, daily cigarette smoking is associated with respiratory ailments,² increased mean lung age,³ neuro-behavioral and cognitive problems, and general malaise among young adults.² Quitting smoking at any age reduces the toll of tobacco-related diseases,⁴ but the greatest benefits of quitting are seen among those who have smoked for relatively few years, smoked only a few cigarettes per day, or who have an absence of disease at the time of quitting.⁴ Smoking cessation by the age of 30 years eliminates most tobacco-specific mortality.^{5,6}

Despite the known benefits of quitting smoking by the age of 30 years, few studies have examined factors associated with quitting behaviors among young adults. Young adults want to quit smoking⁷⁻¹⁰ and may be less successful at quitting than older adult smokers,¹¹ but we have very little understanding of daily and nondaily smoking among young adults. For example, young adults may not have established regular or daily smoking patterns until the ages of 21 years¹² or 23 years¹³ and may have multiple transitions from daily to nondaily tobacco use up to the age of 25 years.^{12,14,15} Although most smokers begin smoking during adolescence, about 20% of smokers begin smoking during young adulthood.^{12,16,17} Many young adults smoke occasionally and smoke relatively few cigarettes per day.^{12,18-21} Previous studies also suggest that there is considerable heterogeneity in smoking among young adults by employment status, socioeconomic status, gender, and race/ethnicity,^{12,22} and quitting behaviors among young adult daily and nondaily smokers may also vary by these sociodemographic factors.^{12,23-26}

In addition to these social variables, smoking variables such as age of onset of regular smoking, menthol cigarette smoking, and nicotine dependence measures affect quitting.

Objectives. We investigated variables associated with quitting behaviors among current, daily, and nondaily young adult smokers in the United States.

Methods. Data from the national 2003 Tobacco Use Special Cessation Supplement to the Current Population Survey were analyzed to identify factors associated with quit attempts and serious intention to quit among young adult smokers aged 18 to 30 years (n=7912).

Results. Daily smokers who smoked 20 or more cigarettes per day, had their first cigarette within 30 minutes of waking, and smoked no usual type were less likely than were their comparison groups to have 1 more or quit attempts. Nondaily smokers who were male, Hispanic, and smoked no usual type of cigarette were also less likely than were their comparison groups to report 1 or more quit attempts. Although unemployed nondaily smokers were more likely than were the employed to report intention to quit, nondaily smokers with an annual family income of \$25 000 to \$49 000 were less likely than were higher-income families to report intention to quit.

Conclusions. Nicotine dependence measures were significantly associated with quitting and intention to quit among daily smokers, but sociodemographics were associated with quitting and intention to quit among nondaily smokers. (*Am J Public Health.* 2007;97:1412-1420. doi:10.2105/AJPH.2006.103697)

Smoking menthol cigarettes is popular among young adults²⁷ and may be associated with greater levels of dependence than non-menthol cigarette smoking.²⁸ These factors along with sociodemographic factors may impede quit attempts among current, daily, and nondaily smokers, particularly among those who have serious intention to quit.

To increase our understanding of factors associated with quitting among young adults, we examined sociodemographic and smoking factors associated with quit attempts and serious intention to quit smoking among young adult smokers aged 18 to 30 years. This age range crosses 2 age categories typically used in surveillance (18 to 24, and 25 to 44), and multiple life transitions (e.g., working, going into the military, marriage, parenting, new social networks and environments, and becoming more autonomous) occur during these time periods. Examining quitting behaviors among smokers may help clarify characteristics of young adults who are more likely to quit smoking, better define quitting behaviors

among daily and nondaily smokers, and ultimately inform the development of appropriate and effective interventions for young adults.

METHODS

Study Design

Cross-sectional data were collected from the 2003 Tobacco Use Special Cessation Supplement (TUSCS) to the Current Population Survey (CPS) to estimate smoking prevalence and assess factors associated with quit attempts and serious intention to quit among young adult current smokers aged 18 to 30 years (n=7912). Young adult smokers and nonsmokers represented approximately 22% (n=33 983) of the total TUSCS sample. The CPS, administered by the US Census Bureau, uses a multistage probability sample design to collect data on a monthly basis from about 50 000 households to produce reliable national and state estimates of labor force characteristics among the civilian, noninstitutionalized US population aged 15 years and older.

Interviews are conducted in person and by telephone (70%) with computer-assisted interviewing.

The Tobacco Use Supplement survey, conducted in conjunction with the CPS every 3 years, collects data on tobacco use and related attitudes and practices among CPS participants, and in 2003, a special cessation supplement survey was conducted. The 2003 TUSCS was sponsored by the National Cancer Institute and the Centers for Disease Control and Prevention to collect data on smoking, former smoking, and quitting behaviors from approximately 250 000 respondents in February, June, and November 2003. About 75% of respondents were interviewed by telephone and 25% in person. Details of the sampling methods have been reported elsewhere.²⁹ The response rate for the TUSCS was 82.8%. Of those interviewed, 76% were self-respondents and were eligible for the entire TUSCS. Proxies, who responded when the intended respondent was not available, were only eligible for items that asked about smoking status and the use of other tobacco products.²⁹

Measures

Sociodemographics. Measures of age, gender, race/ethnicity, employment status, annual family income, and school enrollment were collected from the CPS. Age was categorized as 18 to 24 years and 25 to 30 years. Because of changes to data collection policies by the US Office of Management and Budget in 2001, the CPS now allows respondents to select more than 1 race.²⁹ Race and ethnicity categories included non-Hispanic Blacks, non-Hispanic American Indian/Alaska Natives, non-Hispanic Asian/Pacific Islanders, and non-Hispanic Whites; Hispanics; and persons with 2 or more races. Employment status included the categories employed, unemployed, and not in the labor force. Employed respondents were those who indicated that they did any work as a paid employee or were self-employed. Unemployed respondents were those with no employment but were available for work and were seeking job activity. Those not in the labor force were those not classified as employed or unemployed and may have included retired people, students, people keeping house, or those with long-term disability.²⁹ Annual

family income included the categories less than \$25 000, \$25 000 to \$49 999, and \$50 000 or more. Among respondents aged 18 to 24 years, school enrollment in the past week was categorized as yes or no.

Smoking behavior. Measures of cigarette smoking status, the frequency of smoking, the number of cigarettes smoked per day, the time to the first cigarette after waking, the age of onset of regular smoking, the usual type of cigarette smoked, the number of quit attempts, and a serious intention to quit were collected from the TUSCS.

Never smokers were respondents who indicated that they had smoked fewer than 100 cigarettes in their entire life. Respondents who had smoked at least 100 cigarettes were asked, "Do you now smoke cigarettes every day, some days, or not at all?" **Current smokers** included respondents who indicated that they smoked every day (daily smokers) or some days (nondaily smokers). **Former smokers** were those who responded "not at all."

The number of cigarettes smoked per day was assessed among daily and nondaily current smokers by asking respondents, "On average, about how many cigarettes do you now smoke each day?" In addition to the number of cigarettes smoked per day, the time to the first cigarette was also used as an indicator of nicotine dependence. Both measures have consistently had high item loadings in confirmatory factor analyses,^{30–34} and the time to the first cigarette has been recommended³² or used as an indicator for nicotine dependence in other population-based surveys.³⁵ Current smokers were asked, "How soon after you wake up do you typically smoke your first cigarette of the day?" and, "Would you say you smoked your first cigarette of the day within the first 30 minutes?" Responses were categorized into 30 minutes or less, more than 30 minutes, or varies. Because of the range in the number of cigarettes smoked per day among young adults,^{12,18–20,36,37} responses were categorized into 1 to 5, 6 to 10, 11 to 19, and 20 or more cigarettes per day. The usual type of cigarette smoked was assessed, and response categories included menthol, nonmenthol, and no usual type. The age of onset of smoking was assessed by asking those who had smoked at least 100 cigarettes the age at which they first started smoking fairly regularly.

Quitting behaviors. Quit attempts were assessed by asking current smokers, "How many times during the past 12 months have you stopped smoking for 1 day or longer because you were trying to quit smoking?" Responses were categorized into 1 or more quit attempts and zero quit attempts. The intention to quit was assessed by asking smokers, "Are you seriously considering quitting smoking within the next 6 months?" and included the responses yes or no.

Analysis

The analysis was conducted using SAS 8.2³⁸ and SUDAAN 8.0.1.³⁹ We used SUDAAN to account for the complex sample design and the weights of the respondents. Smoking prevalence estimates were based on weighted self-response variables. We used the χ^2 goodness-of-fit test to determine the statistical significance of the bivariate relations between the outcome variables—quit attempts and the intention to quit—and the independent sociodemographic and smoking variables. Independent variables in the bivariate models with $P < .25$ were entered into the final multivariate models⁴⁰; this P value increases the chances of identifying variables of importance to the outcomes. Gender and age were of particular interest and were included in the final models.

Multivariate logistic regression analyses were conducted to examine predictors of quit attempts and the intention to quit and produce odds ratios and 95% confidence intervals ($P \leq .01$) among self-respondents only. Analyses were conducted for the following outcomes among current, daily, and nondaily smokers: (1) 1 or more quit attempts versus zero quit attempts, (2) 1 or more quit attempts among those with the intention to quit versus zero quit attempts among those with the intention to quit, and (3) the intention to quit among those with 1 or more quit attempts versus no intention to quit among those with 1 or more quit attempts. Participants who did not report income or employment status or respond to the questions assessing nicotine dependence were excluded from the multivariate models. Nondaily smokers who smoked fewer than 12 cigarettes per day in the past 30 days ($n = 825$) were excluded from the multivariate models because

they did not receive the question on the number of quit attempts. School enrollment was not examined in the multivariate models because adults aged 25 to 30 years were ineligible for the school enrollment question.

RESULTS

Sample Characteristics

The TUSCS sample of young adults included 33 983 smokers and nonsmokers (Table 1). Of these, approximately half were women and 55% were aged 18 to 24 years. Nineteen percent were Hispanic and 2% were 2 or more races; the remainder were 61% non-Hispanic White, 13% non-Hispanic Black, 5% non-Hispanic Asian/Pacific Islander, and 0.7% non-Hispanic American Indian/Alaska Native. Seventy-one percent were employed. Approximately one third of the sample reported incomes in each of the 3 income categories.

Smoking Prevalence

Sixty-nine percent of the total sample were never smokers, 22% current smokers, and 8.4% former smokers (Table 1). Of current smokers, 76% were daily and 24% nondaily smokers (data not shown). The prevalence of current smoking, daily smoking, and nondaily smoking was significantly higher among men than among women (Table 1).

Current and daily smoking prevalence was highest among non-Hispanic American Indians/Alaska Natives and nondaily among those with 2 or more races. The unemployed respondents had higher current, daily, and nondaily smoking rates than the employed and those not in the labor force. Young adults with family incomes less than \$25 000 had higher current, daily, and nondaily smoking rates than those with higher incomes.

Quit Attempts Among Young Adult Current Smokers

Among current smokers, employment status, the number of cigarettes smoked per day, having a usual type of cigarette, and the time to the first cigarette were significantly associated with 1 or more quit attempts in the adjusted multivariate model (Table 2). Current smokers not in the labor force were less likely to have quit attempts than were employed current smokers. Young adults

who smoked 20 cigarettes per day or more were less than half as likely to have 1 or more quit attempts than respondents who smoked 5 cigarettes per day or fewer. Also among current smokers, those who smoked no usual type of cigarette were half as likely to have ever attempted quitting than were those who smoked nonmentholated cigarettes. Quit attempts were lower among current smokers who reported having their first cigarette within the first 30 minutes after waking or who reported that the time to the first cigarette after waking varied compared with current smokers who did not. Gender, age, and the age of onset of smoking were not significantly associated with quit attempts.

Daily smokers. Among daily smokers, the number of cigarettes smoked per day, having a usual type of cigarette, and the time to the first cigarette were significantly associated with 1 or more quit attempts (Table 2). Daily smokers who smoked 20 cigarettes per day or more were less likely than those who smoked 5 cigarettes per day or fewer, and respondents with no usual cigarette type were half as likely as nonmentholated cigarette smokers, to report 1 or more quit attempts. Daily smokers who smoked their first cigarette within the first 30 minutes of waking were less likely to have attempted quitting than were daily smokers who did not smoke their first cigarette within the first 30 minutes of waking. Gender, age, employment status, and the age of onset of smoking were not significant.

Nondaily smokers. Gender, race/ethnicity, and having a usual type of cigarette were significantly associated with having 1 or more quit attempts among current nondaily smokers (Table 2). A lower likelihood of having 1 or more quit attempts was observed among men compared with women, among Hispanics compared with non-Hispanic Whites, and among those with no usual type of cigarette compared with nonmentholated cigarette smokers. Age, the age of onset of smoking, and nicotine dependence indicators were not significant.

Quit Attempts Among Young Adult Current Smokers With Intention to Quit

In the multivariate model, nicotine dependence indicators were significantly associated

with quit attempts among current smokers with the intention to quit (Table 3). The odds of having 1 or more quit attempts increased as the number of cigarettes per day decreased. Current smokers who smoked within the first 30 minutes of waking were less likely to have quit attempts than current smokers who did not smoke within 30 minutes of waking. Gender, age, and employment status were not significantly associated with quit attempts among current smokers with an intention to quit.

Daily smokers. Daily smokers who smoked within the first 30 minutes of waking were less likely to have quit attempts than were daily smokers who did not (Table 3). Gender, age, employment status, and the number of cigarettes per day were not significant.

Nondaily smokers. Gender, race/ethnicity, and having a usual type of cigarette were significantly associated with quit attempts among nondaily smokers with the intention to quit, but age was not (Table 3). Men had half the odds of having 1 or more quit attempts compared with women, and nondaily smokers who smoked no usual type of cigarette had one third the odds of having 1 or more quit attempts compared with nonmenthol smokers. Nondaily smokers identifying 2 or more races were 9 times more likely than Whites to report quit attempts.

Intention to Quit Among Young Adult Current Smokers With Quit Attempts

Race/ethnicity, employment status, annual family income, and the number of cigarettes per day were significantly associated with the intention to quit among current smokers with 1 or more quit attempts in the multivariate model (Table 4). Among current smokers, non-Hispanic Blacks were 1.7 times more likely than were non-Hispanic Whites, and the unemployed were 1.5 times more likely than were the employed to report the intention to quit. Current smokers with incomes of \$25 000 to \$49 999 were less likely to have the intention to quit than were current smokers with higher incomes, and current smokers who smoked more than 5 cigarettes per day were less likely to have the intention to quit than were smokers who smoked 5 or fewer cigarettes per day. Gender, age, and the time to the first cigarette

TABLE 1—Sample Characteristics and Prevalence of Smoking Among Young Adults Aged 18 to 30 Years, by Sociodemographic Factors: Tobacco Use Special Cessation Supplement to the Current Population Survey, 2003

	Total ^a		Current Smokers ^b		Daily Smokers ^b		Nondaily Smokers ^b	
	No.	% (95% CI) ^c	No.	% (95% CI) ^c	No.	% (95% CI) ^c	No.	% (95% CI) ^c
Total	33 983	100%	7 912	22.16 (21.56, 22.76)	6 063	16.75 (16.20, 17.31)	1 849	5.41 (5.13, 5.70)
Gender								
Men	15 172	49.83 (49.57, 50.08)	3 851	24.33 (23.43, 25.25)	2 925	18.18 (17.39, 19.01)	926	6.14 (5.66, 6.66)
Women	18 811	50.18 (49.92, 50.43)	4 061	20.00 (19.38, 20.64)	3 138	15.32 (14.76, 15.90)	923	4.68 (4.34, 5.05)
Age, y								
18–24	16 395	54.87 (54.59, 55.15)	3 869	22.50 (21.69, 23.34)	3 000	17.31 (16.59, 18.05)	869	5.20 (4.83, 5.59)
25–30	17 588	45.13 (44.85, 45.41)	4 043	21.74 (21.02, 22.48)	3 063	16.07 (15.45, 16.71)	980	5.67 (5.29, 6.07)
Race/ethnicity								
Non-Hispanic Black	3 400	13.02 (12.81, 13.22)	582	16.90 (15.52, 18.37)	443	12.42 (11.23, 13.72)	139	4.48 (3.75, 5.34)
Non-Hispanic White	23 027	61.09 (60.81, 61.37)	6 112	26.52 (25.67, 27.39)	4 818	20.90 (20.11, 21.72)	1 294	5.62 (5.24, 6.01)
Non-Hispanic American Indian/ Alaska Native	400	0.65 (0.54, 0.77)	152	35.94 (28.77, 43.78)	112	25.91 (19.39, 33.72)	40	10.02 (6.50, 15.16)
Non-Hispanic Asian/Pacific Islander	1 312	4.95 (4.78, 5.12)	166	11.46 (9.53, 13.73)	115	7.41 (5.85, 9.34)	51	4.05 (2.90, 5.64)
Hispanic	5 232	18.75 (18.55, 18.94)	700	12.95(11.89, 14.10)	431	7.88 (7.04, 8.81)	269	5.08 (4.40, 5.85)
Multiracial (at least 2 races)	612	1.56 (1.44, 1.68)	200	33.97 (29.45, 38.82)	144	22.58 (18.91, 26.72)	56	11.40 (8.21, 15.61)
Employment status ^e								
Employed	24 741	71.05 (70.53, 71.57)	5 743	22.49 (21.79, 23.22)	4 338	16.80 (16.17, 17.44)	1 405	5.70 (5.35, 6.07)
Unemployed	2 448	7.94 (7.61, 8.29)	853	32.89 (30.86, 35.00)	663	25.13 (23.31, 27.05)	160	7.76 (6.52, 9.22)
Not in labor force	6 794	21.00 (20.48, 21.54)	1 316	16.95 (15.94, 18.01)	1 062	13.42 (12.41, 14.49)	254	3.54 (3.10, 4.03)
Enrolled in school last week								
Yes	5 255	19.09 (18.55, 19.65)	726	13.35 (12.23, 14.55)	480	8.72 (7.84, 9.67)	246	4.63 (4.01, 5.34)
No	11 140	35.77 (35.25, 36.30)	3 143	27.39 (26.34, 28.47)	2 520	21.89 (20.93, 22.88)	623	5.50 (5.02, 6.02)
Not applicable ^d	17 588	45.13 (44.85, 45.41)	4 043	21.74 (21.02, 22.48)	3 063	16.07 (14.45, 16.71)	980	5.67 (5.29, 6.07)
Annual family income, \$								
<25 000	10 326	30.55 (59.53, 31.59)	3 150	28.15 (27.02, 29.30)	2 478	21.78 (20.63, 22.97)	672	6.37 (5.87, 6.92)
25 000–49 000	9 848	27.74 (27.09, 28.51)	2 380	23.57 (22.50, 24.67)	1 857	18.22 (17.31, 19.16)	523	5.35 (4.86, 5.89)
≥50 000	10 716	31.78 (31.03, 32.55)	1 761	16.12 (15.32, 16.97)	1 241	11.27 (10.47, 12.12)	520	4.86 (4.40, 5.36)
Refused/unknown	3 093	9.92 (9.38, 10.50)	621	19.08 (17.42, 20.87)	487	14.72 (13.21, 16.37)	134	4.37 (3.68, 5.17)
Smoking status ^e								
Never	22 924	69.44 (68.79, 70.08)						
Current	7 912	22.16 (21.56, 22.76)						
Former	3 147	8.40 (8.01, 8.81)						

Note. CI = confidence interval.

^aIncludes smokers and nonsmokers.

^bCurrent smokers were those respondents who indicated that they smoked every day (daily smokers) or some days (nondaily smokers).

^cThe denominator is the total sample of young adults, which includes smokers and nonsmokers (n = 33 983).

^dEmployed respondents were those who did any work as a paid employee or who were self-employed. Unemployed respondents were those with no employment but were available for work and were seeking job activity. Those not in the labor force were those not classified as employed or unemployed and may have included retired people, students, people keeping house, or those with long-term disability.

^eOnly respondents aged 24 years and younger were asked if they were enrolled in a high school, college, or university during the week before the survey.

^fNever smokers were respondents who had smoked fewer than 100 cigarettes in their entire life. Former smokers were those who responded “not at all.”

after waking were not significant in this model.

None of the variables were significantly associated with a serious intention to quit among daily smokers with 1 or more quit attempts (Table 4). However, unemployed nondaily smokers were 7 times more likely than were employed nondaily smokers to

report an intention to quit. Nondaily smokers with incomes between \$25 000 and \$49 999 were one third as likely to have the intention to quit as were nondaily smokers with higher incomes. Gender and age were not associated with the intention to quit among nondaily smokers with quit attempts.

DISCUSSION

Our results confirm that factors associated with quit attempts and a serious intention to quit vary for daily and nondaily young adult smokers. Among daily smokers, the number of cigarettes per day and the time to the first cigarette after waking were more important in

TABLE 2—Multivariate Logistic Regression of 1 or More Quit Attempts During the Past 12 Months Among Young Adult Smokers Aged 18 to 30 Years: Tobacco Use Special Cessation Supplement to the Current Population Survey, 2003

	Current Smokers, ^a OR (95% CI)	Daily Smokers, ^a OR (95% CI)	Nondaily Smokers, ^a OR (95% CI)
Total	6712	5765	952
Gender			
Men	0.96 (0.84, 1.11)	1.00 (0.87, 1.16)	0.68 (0.48, 0.98)*
Women	1.00	1.00	1.00
Age, y			
18–24	1.05 (0.92, 1.19)	1.08 (0.93, 1.25)	0.88 (0.64, 1.19)
25–30	1.00	1.00	1.00
Race/ethnicity			
Non-Hispanic Black	NS	NS	1.51 (0.78, 2.92)
Non-Hispanic White	NS	NS	1.00
Non-Hispanic American Indian/ Alaska Native	NS	NS	0.66 (0.17, 2.52)
Non-Hispanic Asian/Pacific Islander	NS	NS	0.59 (0.22, 1.59)
Hispanic	NS	NS	0.63 (0.40, 0.98)*
Multiracial (at least 2 races)	NS	NS	1.75 (0.59, 5.15)
Employment status ^b			
Employed	1.00	1.00	NS
Unemployed	1.01 (0.81, 1.25)	0.96 (0.76, 1.23)	NS
Not in labor force	0.82 (0.67, 0.99)*	0.93 (0.68, 1.01)	NS
Age of smoking onset, y			
14	0.96 (0.82, 1.12)	0.96 (0.81, 1.12)	1.12 (0.66, 1.89)
15–17	0.88 (0.76, 1.03)	0.91 (0.77, 1.06)	0.82 (0.56, 1.20)
≥18	1.00	1.00	1.00
Cigarettes per day			
≤5	1.00	1.00	NS
6–10	0.69 (0.59, 0.81)***	0.92 (0.74, 1.14)	NS
11–19	0.64 (0.52, 0.80)***	0.87 (0.68, 1.11)	NS
≥20	0.42 (0.35, 0.50)***	0.89 (0.46, 0.75)***	NS
Usual type of cigarette			
Menthol	1.00 (0.89, 1.16)	1.00 (0.85, 1.18)	0.93 (0.62, 1.41)
Nonmenthol	1.00	1.00	1.00
No usual type	0.46 (0.32, 0.67)***	0.51 (0.34, 0.76)***	0.30 (0.14, 0.65)**
Smokes first cigarette within 30 minutes of waking			
Yes	0.76 (0.66, 0.88)*	0.74 (0.64, 0.85)***	1.70 (0.96, 3.04)
No	1.00	1.00	1.00
Varies	0.60 (0.37, 0.98)*	0.41 (0.15, 1.08)	1.23 (0.28, 5.42)

Note. OR = odds ratio; CI = confidence interval; NS = not significant in the bivariate model.

^aCurrent smokers were those respondents who indicated that they smoked every day (daily smokers) or some days (nondaily smokers).

^bEmployed respondents were those who did any work as a paid employee or who were self-employed. Unemployed respondents were those with no employment but were available for work and were seeking job activity. Those not in the labor force were those not classified as employed or unemployed and may have included retired people, students, people keeping house, or those with long-term disability.

* $P \leq .05$; ** $P \leq .01$; *** $P \leq .001$.

Among daily smokers with a serious intention to quit, only the time to the first cigarette after waking was associated with quit attempts; however, among nondaily smokers, gender, race/ethnicity, and smoking a usual type of cigarette remained significant in this model. No factors were associated with the intention to quit among daily smokers who reported quit attempts, but employment status and annual family income were associated with the intention to quit among nondaily smokers. In summary, differences in variables associated with quit attempts and the intention to quit can be explained by sociodemographic factors among nondaily smokers and nicotine dependence measures among daily smokers.

This is one of the first studies to examine nicotine dependence in a national US sample of young adult daily and nondaily smokers. The results indicate that neither the number of cigarettes per day nor the time to the first cigarette after awakening were associated with quitting among nondaily smokers, and nondaily smokers who said that the time to the first cigarette after awakening varied were less likely than nondaily smokers who did not smoke their first cigarette within 30 minutes of waking to have had 1 or more quit attempts. Several factors may explain these findings. Some nondaily young adult smokers may be “chippers,” smokers who never become addicted, experience no discomfort from abstaining,^{41,42} and therefore have their first cigarette when they decide to self-administer nicotine rather than having the addiction dictating their response.⁴³ Other studies have found that young adults wait longer than older adults to smoke their first cigarette after waking,¹² and adults who smoke only occasionally (nondaily) on average indicate 7.0 hours since their last cigarette compared with 0.5 hours among heavy (daily) smokers.⁴⁴

Waiting may be associated with less established patterns or chipping rather than dependence. Furthermore, it has been found that young adults who indicated that the time to their first cigarette after waking varied may not have established regular smoking patterns and therefore may have felt indifferent to quitting because they did not perceive themselves as smokers.⁴⁵ These findings suggest a need to better characterize dependence and nondependence among young adult smokers.

predicting quit attempts than were socio-demographic factors. Among nondaily smokers, gender, race/ethnicity, and smoking a

usual type of cigarette were associated with quit attempts, but nicotine dependence measures were not.

TABLE 3—Multivariate Logistic Regression of 1 or More Quit Attempts During the Past 12 Months Among Young Adult Smokers Aged 18 to 30 Years Who Reported Serious Intention to Quit Within the Next 6 Months: Tobacco Use Special Cessation Supplement to the Current Population Survey, 2003

	Current Smokers, ^a OR (95% CI)	Daily Smokers, ^a OR (95% CI)	Nondaily Smokers, ^a OR (95% CI)
Total	2880	2294	590
Gender			
Men	0.96 (0.78, 1.17)	1.03 (0.83, 1.28)	0.55 (0.34, 0.90)*
Women	1.00	1.00	1.00
Age, y			
18–24	1.19 (0.96, 1.47)	1.20 (0.94, 1.54)	1.10 (0.66, 1.83)
25–30	1.00	1.00	1.00
Race/ethnicity			
Non-Hispanic Black	NS	NS	1.95 (0.44, 8.64)
Non-Hispanic White	NS	NS	1.00
Non-Hispanic American Indian/ Alaska Native	NS	NS	3.08 (0.24, 39.20)
Non-Hispanic Asian/Pacific Islander	NS	NS	0.54 (0.12, 2.58)
Hispanic	NS	NS	0.77 (0.37, 1.59)
Multiracial (at least 2 races)	NS	NS	9.19 (1.42, 59.43)*
Employment status ^b			
Employed	1.00	1.00	NS
Unemployed	0.93 (0.71, 1.23)	0.89 (0.65, 1.22)	NS
Not in labor force	0.80 (0.61, 1.05)	0.78 (0.57, 1.07)	NS
Cigarettes per day			
≤5	1.00	1.00	NS
6–10	0.76 (0.59, 0.99)*	1.23 (0.89, 1.70)	NS
11–19	0.65 (0.46, 0.93)*	1.05 (0.71, 1.57)	NS
≥20	0.46 (0.34, 0.61)***	0.78 (0.54, 1.13)	NS
Usual type			
Menthol	NS	NS	1.35 (0.60, 3.03)
Nonmenthol	NS	NS	1.00
No usual type	NS	NS	0.30 (0.09, 0.96)*
First cigarette within 30 min of waking			
Yes	0.76 (0.61, 0.95)*	0.76 (0.60, 0.95)*	NS
No	1.00	1.00	NS
Varies	1.72 (0.42, 7.04)	0.74 (0.12, 4.63)	NS

Note. OR = odds ratio; CI = confidence interval; NS = not significant in the bivariate model.

^aCurrent smokers were those respondents who indicated that they smoked every day (daily smokers) or some days (nondaily smokers).

^bEmployed respondents were those who did any work as a paid employee or who were self-employed. Unemployed respondents were those with no employment but were available for work and were seeking job activity. Those not in the labor force were those not classified as employed or unemployed and may have included retired people, students, people keeping house, or those with long-term disability.

* $P \leq .05$; ** $P \leq .01$; *** $P \leq .001$.

Factors such as the type of cigarette (mentholated vs nonmentholated) smoked, which may influence levels of dependence, were also associated with quitting behaviors. In 3 of the models, not having a usual type of cigarette was associated with lower odds of

quitting behaviors for daily and nondaily smokers. On the basis of the survey question, it is not clear whether the no-usual-type smokers were actually brand switchers; however, one study suggested the contrary, which is that brand switchers are more likely to try

to quit.⁷ Future studies should measure nicotine dependence and self-efficacy to quit and should explore these smokers' attitudes and behaviors concerning cigarette preference.

Sociodemographic factors such as age and gender showed little or no significance in the models. We did not find differences in quit attempts and the intention to quit by age. Male nondaily smokers were less likely to have had quit attempts and an intention to quit than were female nondaily smokers. Young women may not be as successful as men in quitting⁴⁶ or sustained quitting, and men may be using multiple tobacco products during young adulthood, which may also explain lower quit attempts. Smoking cessation among women varies by age, race/ethnicity, education, and income level,⁴⁷ and it is not clear how gender interacts with these variables, particularly among nondaily smokers. Quitting among daily and nondaily female smokers may diverge from quitting among men because of life transitions (such as having children).^{9,10,48} Longitudinal studies may help assess how quitting patterns differ and determine how contextual factors, other tobacco use, and psychosocial factors are associated with quitting among young men and women.

Race/ethnicity was a significant factor for nondaily smokers. Hispanic nondaily smokers had lower odds of quit attempts than did non-Hispanic Whites, which is consistent with another study.²¹ A large proportion of Hispanic smokers smoke fewer cigarettes per day than do non-Hispanic Whites.^{49–51} Furthermore, Hispanics are more likely to be nondaily smokers than are non-Hispanic Whites.^{18,19,52} Nondaily smoking among Hispanics in young adulthood may reflect established, regular smoking patterns, whereas among non-Hispanic Whites it may reflect transitional or nonestablished nondaily smoking patterns.¹⁸ The established, regular nondaily smokers may have quitting behaviors distinct from those intentionally transitioning from daily to nondaily smoking as part of their path to quitting and from those who are on their way to establishing regular daily smoking. Furthermore, established nondaily Hispanic smokers may not quit because of low perceived health risk of nondaily smoking. Future studies may investigate how quitting among Hispanics and those who self-identify

TABLE 4—Multivariate Logistic Regression of Serious Intention to Quit Within the Next 6 Months Among Young Adult Smokers Aged 18 to 30 Years Who Reported 1 or More Quit Attempts Within the Past 12 Months: Tobacco Use Special Cessation Supplement to the Current Population Survey, 2003

	Current Smokers, ^a OR (95% CI)	Daily Smokers, ^a OR (95% CI)	Nondaily Smokers, ^a OR (95% CI)
Total	2827	2388	599
Gender			
Men	1.10 (0.89, 1.35)	1.13 (0.93, 1.37)	0.92 (0.58, 1.46)
Women	1.00	1.00	1.00
Age, y			
18–24	0.90 (0.71, 1.14)	0.85 (0.67, 1.08)	1.67 (0.91, 3.07)
25–30	1.00	1.00	1.00
Race/ethnicity			
Non-Hispanic Black	1.71 (1.10, 2.65)*	1.49 (0.99, 2.25)	NS
Non-Hispanic White	1.00	1.00	NS
Non-Hispanic American Indian/ Alaska Native	0.79 (0.34, 1.84)	0.48 (0.20, 1.14)	NS
Non-Hispanic Asian/Pacific Islander	1.11 (0.51, 2.56)	0.69 (0.27, 1.74)	NS
Hispanic	0.83 (0.60, 1.14)	1.01 (0.71, 1.45)	NS
Multiracial (at least 2 races)	1.14 (0.71, 1.83)	1.04 (0.55, 1.94)	NS
Employment status ^b			
Employed	1.00	1.00	1.00
Unemployed	1.49 (1.05, 2.09)*	1.21 (0.87, 1.69)	7.13 (1.65, 30.79)**
Not in labor force	0.89 (0.69, 1.15)	0.77 (0.59, 1.01)	2.06 (0.94, 4.50)
Annual family income, \$			
25 000	0.87 (0.70, 1.08)	NS	0.53 (0.56, 1.09)
25 000–49 000	0.76 (0.59, 0.97)*	NS	0.37 (0.19, 0.70)**
≥50 000	1.00	1.00	1.00
Age of onset, y			
≤14	NS	1.05 (0.78, 1.41)	NS
15–17	NS	0.84 (0.67, 1.06)	NS
≥18	NS	1.00	NS
Cigarettes per day			
≤5	1.00	NS	NS
6–10	0.67 (0.51, 0.89)**	NS	NS
11–19	0.62 (0.44, 0.87)**	NS	NS
≥20	0.58 (0.42, 0.80)***	NS	NS
First cigarette within 30 min of waking			
Yes	0.91 (0.71, 1.16)	0.89 (0.72, 1.10)	NS
No	1.00	1.00	NS
Varies	1.33 (0.38, 4.63)	0.60 (0.19, 1.95)	NS

Note. OR = odds ratio; CI = confidence interval; NS = not significant in the bivariate model.

^aCurrent smokers were those respondents who indicated that they smoked every day (daily smokers) or some days (nondaily smokers).

^bEmployed respondents were those who did any work as a paid employee or who were self-employed. Unemployed respondents were those with no employment but were available for work and were seeking job activity. Those not in the labor force were those not classified as employed or unemployed and may have included retired people, students, people keeping house, or those with long-term disability.

P* ≤ .05; *P* ≤ .01; ****P* ≤ .001.

multiracial is associated with culture, acculturation, biculturalism, and immigration status.

We found that unemployed people were more likely to be seriously considering quitting

than were employed people. The intention to quit may be associated with an inability to afford cigarettes, and the perceived lack of control one might feel from losing a job or being

between jobs may serve as the impetus for taking control of one's smoking behavior. As work becomes meaningful for young adults, researchers should examine how employment status affects smoking cessation.^{22,23}

There were several limitations to this study. The data were cross-sectional, which limits the ability to determine the directionality of the relations and measure the dynamic processes of quitting, nicotine dependence, and lifetime transitions. Small sample sizes for racial/ethnic and employment groups among nondaily smokers and those with no usual type of cigarette may have affected the power of these analyses to detect additional significant associations in the multivariate models and to provide stable estimates.

Despite these limitations, our data suggest that nicotine dependence plays a role in quitting behaviors among young adult daily smokers; however, sociodemographic factors appear to be more important among nondaily smokers. Future studies should determine whether the differential operation of nicotine dependence in daily and nondaily smokers is associated with the lack of established smoking, chipping, or other sociocultural factors. The tobacco industry has invested a large share of resources into capturing the young adult market⁵³ and has capitalized on major life transitions⁵⁴ to secure brand loyalty⁵⁵ and cultivate addiction among various segments of young adults.^{56,57} Studies are needed to examine psychosocial and contextual factors among young adults to better understand how young adults differ from adolescents and older adults. Furthermore, researchers need to use such data to test cessation messages for different types of young adult smokers. ■

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Contributors

P. Fagan led the writing and analysis team and drafted and conducted final revisions to the article. E. Augustson helped to direct the analysis and revise the methods section. C.L. Backinger helped direct the analysis and revise the introduction and discussion. M.E. O'Connell developed the tables and helped edit and revise the introduction and discussion. R.E. Vollinger, Jr, helped with the overall revisions and contributed to the development of the analysis plan. A. Kaufman helped write the introduction and provided references. J. T. Gibson ran the data in SAS and SUDAAN.

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Human Participant Protection

The research was determined to be exempt from institutional review board review at the National Institutes of Health.

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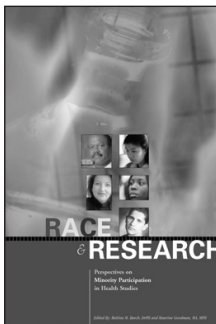
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