Original investigation

Past Year Quit Attempts and Use of Cessation Resources Among Cigarette-Only Smokers and Cigarette Smokers Who Use Other Tobacco Products

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Abstract

Introduction: It is unclear how use of other tobacco products impacts cigarette-smoking cessation. We assessed differences in past year cigarette smoking quit attempts and use of counseling and medication among current cigarette-only users, cigarette and cigar users, and cigarette and smokeless tobacco (SLT) users.

Methods: Data came from 24 448 current cigarette-only, 1064 cigarette and cigar only, and 508 cigarette and SLT only users who responded to the 2010–2011 Tobacco Use Supplement to the Current Population Survey. Demographic, smoking, and cessation characteristics were computed by group. Bivariate and multivariable logistic regression models assessed the relationship of tobacco use group to making a past year quit attempt, and use of counseling or medication during the last quit attempt.

Results: Dual users of cigarettes and cigars or SLT had similar interest in quitting and prevalence of reported past year quit attempts compared to cigarette-only users. In unadjusted analyses, cigarette and SLT users had higher odds of trying to quit in the past year compared to cigarette-only users (odds ratio [OR] = 1.31, 95% confidence interval [CI] = 1.05, 1.64); no differences were found for cigarette and cigar users. However, adjusting for demographic and cigarette smoking variables, both groups of dual users had similar odds as cigarette-only users for having made a past year cigarette smoking quit attempt, and to have used counseling or medication during the last quit attempt.

Conclusion: Dual tobacco use was not associated with decreased attempts to quit smoking cigarettes; however, use of evidence-based treatment was sub-optimal among cigarette-only and dual users, and should be increased.

Introduction

While cigarettes remain the predominant form of tobacco used in the United States, alternative, non-cigarette forms of tobacco and the dual use of combustible and noncombustible tobacco products are

being aggressively promoted by tobacco companies.¹ In particular, dual use of cigarettes and cigars, and of cigarettes and smokeless tobacco (SLT) have become more common in recent years.^{1–4} Data from the 2012 National Survey on Drug Use and Health suggest

that 10% of young adults and 4% of adults 26 years of age or older are current users of more than one tobacco product, with the most common combination in all age groups being use of cigarettes and cigars, followed by use of cigarettes and SLT.¹ Dual use is a particularly concerning trend because it may prolong continued nicotine dependence and cigarette use and undermine attempts to completely quit cigarette smoking.^{1,4}

Reasons for dual use of cigarettes and cigars have not been well studied. One possible reason is that little cigars and cigarillos are not subject to the same US Food and Drug Administration regulations as cigarettes. Little cigars and cigarillos are often less expensive than cigarettes because of tax differences at federal and state levels,⁵ which could lead smokers to substitute a cheaper product for some of their cigarette use. Another possible reason is that cigars include flavored products that have been heavily marketed to appeal to young adult and minority populations.^{6,7} Young adults, in particular, may be trying a variety of tobacco products,^{8,9} which could lead to dual use patterns.

Reasons for dual use of cigarettes and SLT in the United States include perceptions among cigarette users that SLT products are less harmful¹⁰ and the marketing of many SLT products as complements to cigarettes or for use in smoke-free environments or at times when smoking a cigarette is not possible.¹¹ However, data suggest that tobacco users in the United States do not see SLT products as a viable replacement for cigarettes.¹² For example, a recent nationally representative study found that more than two-thirds of dual users of cigarettes and SLT reported using SLT in places where they could not smoke, and 75% did not believe that SLT would help them quit smoking cigarettes.¹³ Further, the 2008 update of the US Public Health Service's guideline on *Treating Tobacco Use and Dependence* found no evidence to suggest that other tobacco products are effective in helping smokers to quit.¹⁴

Data are inconclusive about how users of cigarettes and other combusted or noncombusted tobacco products approach quitting and whether their cigarette smoking and cessation behaviors are similar or different from cigarette-only users. For example, a recent study explored the relationship between alternative tobacco product use (eg, loose leaf, moist snuff, snus, dissolvables, e-cigarettes) and intentions to quit cigarette smoking or successful cessation. Alternative tobacco product use was associated with having made a quit attempt, and those who intended to quit smoking were more likely to be current users of alternative tobacco products than smokers with no intention to quit.¹⁵ However, another study found that dual users of cigarettes and SLT were less likely than cigarette-only users to intend to quit in the next 6 months, with 42.3% of dual users reporting they never wanted to quit versus 26.3% of cigarette-only users.¹³ To our knowledge, no nationally representative studies have assessed smoking cessation behaviors among cigarette-only smokers and the two most common groups of dual users: cigarette and cigar only users, and cigarette and SLT only users.

Current smokers remain an important group to study and understand, since they represent individuals who may have tried to quit, or may want to quit, but have not been successful. Knowledge of how quit attempts and use of evidence-based cessation resources differ between current cigarette-only and dual users will help researchers understand the relationship between dual use and attempting to quit. Accordingly, this study sought to assess (1) demographic differences among tobacco use groups (cigarette-only, cigarette and cigar only, and cigarette and SLT only), (2) differences in a variety of cessation measures, including reported lifetime quit attempts, interest

in quitting, past year cigarette smoking quit attempts (number and length) and use of smoking cessation resources by tobacco use group, and (3) the association between tobacco use group and making a past year cigarette smoking cessation attempt or using evidence-based cessation resources, after adjusting for covariates.

Methods

Sample

Data for this study came from the 2010–2011 Tobacco Use Supplement (TUS) to the Current Population Survey (CPS). The CPS is a cross-sectional household survey conducted by the US Census Bureau monthly through telephone and household interviews. The CPS samples civilian, non-institutionalized US adults 18 years of age or older. Every four years, the National Cancer Institute sponsors a TUS to the monthly CPS. For the 2010–2011 TUS, questions were added to the CPS surveys in May 2010, August 2010, and January 2011. Response rates for the three data collection periods were 79%, 79%, and 78%, respectively. The total number of completed interviews was 180 934 (67 915 in May 2010, 48 010 in August 2010, and 64 109 in January 2011). This study focused on a subsample of 26 020 people who reported current use of cigarettes only ($n = 24\,448$), cigarettes and cigars only ($n = 1064$), or cigarettes and SLT only ($n = 508$). More details about the survey methodology can be found elsewhere.¹⁶

Measures

This study analyzed data from cross-sectional questions about current use of cigarettes, cigars, SLT, and other products (eg, pipes, hookah); past year quit attempts; and use of cessation methods during the last quit attempt. Current cigarette smoking was defined by using the following two questions: "Have you smoked at least 100 cigarettes in your entire life?" and "Do you now smoke cigarettes every day, some days, or not at all?" People who smoked at least 100 cigarettes in their life and who smoked every day or some days at the time of the survey were categorized as current smokers. Those who smoked fewer than 12 days in the past 30 days were categorized as light some day smokers. These respondents were not asked all cessation-related questions because of skip patterns in the survey instrument and were excluded from some analyses in this study.

Other tobacco product use was defined as any reported use within the past 30 days for each of the following product categories: SLT (snuff, dip, chew, and snus), cigars (cigars, cigarillos, and small cigars), pipe, and hookah or water pipe. Categories of tobacco use were mutually exclusive and defined as follows: current cigarette-only use ($n = 24\,448$); current cigarette and cigar use (with no other tobacco product use) ($n = 1064$), and current cigarette and SLT use (with no other tobacco product use) ($n = 508$). Sample sizes for people who used cigarettes and hookah ($n = 106$); cigarettes and pipe ($n = 93$); and cigarettes, cigars, and SLT ($n = 117$) were not large enough for analysis and were omitted.

Current smokers were asked if they had ever tried to quit smoking cigarettes, if they had tried to quit smoking cigarettes in the past year, if they were seriously considering quitting cigarettes, and what their interest level in quitting was (on a numerical 1–10 scale where 1 was not at all interested and 10 was extremely interested). Those who reported any interest in quitting cigarettes (eg, interest level 2–10) were asked what they thought their likelihood of succeeding

would be if they tried to quit in the next 6 months (answers included not likely, a little likely, somewhat likely, and very likely).

Those who reported having made at least one attempt to quit smoking cigarettes in the past year (excluding light some day smokers smoking <12 of the past 30 days) were asked how many times they tried to quit in the past year and the length of their last quit attempt. Regardless of the number of days they smoked, those who reported at least one quit attempt of 1 day or longer in the past year were also asked about their use of evidence-based cessation resources, including cessation medications and counseling (eg, one-on-one counseling; a telephone helpline or quitline; or a stop-smoking clinic, class, or support group). Variables were also created to assess the use of either counseling or medication (eg, a “yes” response to any of the counseling or medications assessed) or both counseling and medication (eg, a “yes” response to at least one counseling approach and at least one medication).

Demographic information taken from the CPS survey included sex, race/ethnicity (white non-Hispanic, black non-Hispanic, Hispanic, and other), age (18–24, 25–44, 45–64, and ≥65 years), education (<high school, high school or General Equivalency Diploma [GED], some college, and college or more) and geographical region (Northeast, Midwest, South, and West).

Analysis

The landline and household data were weighted by the probability of selection of the telephone number or household, the probability of selecting the respondent, and a nonresponse adjustment. Datasets from each of the 3 months of data collection were combined to form one dataset. Analyses were conducted in SAS-callable SUDAAN software to account for the complex survey design; balanced repeated replication was used to weight the data, with each weight being divided by three to account for the 3 months of data collection.

Weighted frequencies and means/standard deviations were calculated for sociodemographic characteristics, smoking characteristics, and cessation practices. Chi-square tests and nonoverlapping confidence intervals were used to compare frequencies across groups of cigarette-only users, cigarette and cigar users, and cigarette and SLT users. If the standard error was >40% of the point estimate, data were determined to be statistically unreliable and were suppressed. Bivariate and multivariable logistic regression models were used to assess correlates of making a past year quit attempt, and among those who tried to quit in the past year, correlates of using either medication or counseling during the last quit attempt. Multivariable models were adjusted for sex, race/ethnicity, age, cigarette smoking frequency and amount, and menthol use. Alpha levels for all analyses were set at 0.05. Missing data were not imputed. Sample sizes for the bivariate and multivariable analyses are provided in Tables 1–3, along with the results of the statistical tests. Wald chi-square tests were used to test for significance in the multivariable models, with alpha level of 0.05.

Results

Of the total sample, 14.2% were cigarette-only users, 0.7% were cigarette and cigar only users, and 0.3% were cigarette and SLT only users. Among all current cigarette smokers in the sample, 91.2% were cigarette-only users, 4.5% were cigarette and cigar only users, and 2.0% were cigarette and SLT only users.

Demographic Differences

Both the cigarette and cigar group and the cigarette and SLT group had a higher percentage of males than the cigarette-only group (78.6% and 94.7%, respectively, vs. 51.1%; Table 1). A higher percentage of people in the cigarette and SLT group were white compared to those in the other two groups (89.2% vs. 73.5% for cigarette-only users and 70.0% for cigarette and cigar users). A higher percentage of people in both of the dual use groups were young or middle-aged compared to those in the cigarette-only group. A higher percentage of people using cigarettes and SLT were from the Midwest (32.2%) compared to those using cigarettes and cigars (22.6%) or cigarettes only (25.8%). Compared with cigarette-only users (19.9%) and cigarette and cigar users (22.3%), a significantly higher percentage of those using cigarettes and SLT were some day smokers (34.3%). A higher percentage of cigarette-only and cigarette and cigar users reported primarily smoking menthol than did cigarette and SLT users (30.5% and 31.2%, respectively, vs. 19.5%). Time to first cigarette did not differ between the three groups (first cigarette ≤30 minutes of waking: 46.9%, 49.8%, and 47.0%, respectively; Table 1).

Differences in Smoking Cessation Behaviors

In unadjusted analyses, a higher percentage of combined cigarette and SLT users reported they had tried to quit smoking cigarettes for a day or more in the past year (45.7%) compared to cigarette-only users (36.6%; Table 2). However, the percentage of people who reported they had ever tried to quit was similar between the three groups. Interest in quitting cigarettes, the percentage of those considering quitting within 30 days, and the perceived likelihood of succeeding were also similar among the groups. Compared with cigarette-only users (5.6%), a significantly smaller percentage of those using cigarettes and SLT reported they had used counseling during the last quit attempt (1.7%; Table 2). Use of cessation medications during the last quit attempt did not differ significantly between groups. Compared with the other groups, a lower percentage of cigarette and SLT users reported using both counseling and medication during their last quit attempt (1.0% for cigarette and SLT users vs. 4.1% for cigarette-only users and 4.5% for cigarette and cigar users).

Association Between Tobacco Use Group and Making a Past Year Quit Attempt

In a bivariate logistic regression model, tobacco use group was significantly associated with making a past year quit attempt; those in the cigarette and SLT group had higher odds of reporting that they had tried to quit in the past year than did those in the cigarette-only group (odds ratio [OR] = 1.31, 95% confidence interval [CI] = 1.05 to 1.64%; Table 3). However, after adjusting for other sociodemographic and smoking characteristics, tobacco use group was no longer a significant correlate. In the multivariable logistic regression model, significant correlates of making a past year quit attempt included race/ethnicity (Hispanics had lower odds of trying to quit in the past year than whites); age, (those 45–64 and ≥65 years of age had lower odds of trying to quit in the past year than those 18–24 years of age), and cigarette smoking frequency (all categories of daily smokers had lower odds of trying to quit than some day smokers). Adjusting for interest in quitting and seriously considering quitting did not change the association between tobacco use group and making a past year quit attempt.

Table 1. Sociodemographic and Smoking Characteristics of Cigarette-Only and Dual Tobacco User Groups, Tobacco Use Supplement to the Current Population Survey, 2010–2011

	Cigarette-only, <i>n</i> = 24 448, wt% (95% CI)	Cigarette and cigar only, <i>n</i> = 1064, wt% (95% CI)	Cigarette and SLT only, <i>n</i> = 508, wt% (95% CI)
Sex			
Male	51.08 (50.43, 51.73)	78.58 (75.65, 81.24)	94.69 (92.00, 96.51)
Female	48.92 (48.27, 49.57)	21.42 (18.76, 24.35)	5.31 (3.49, 8.00)
Race/ethnicity			
White, non-Hispanic	73.54 (72.89, 74.19)	69.97 (66.61, 73.12)	89.21 (86.17, 91.64)
Black, non-Hispanic	11.46 (10.94, 12.00)	15.39 (12.89, 18.27)	— ^b
Hispanic	9.81 (9.30, 10.33)	9.25 (7.22, 11.78)	3.54 (2.05, 6.05)
Other, non-Hispanic	5.30 (4.88, 5.53)	5.40 (4.05, 7.17)	4.30 (2.77, 6.61)
Age, years			
18–24	12.60 (12.09, 13.12)	20.16 (17.04, 23.70)	26.19 (20.83, 32.36)
25–44	29.47 (38.76, 40.18)	40.42 (36.74, 44.21)	52.28 (46.96, 57.55)
45–64	39.55 (38.84, 40.27)	35.12 (32.00, 38.38)	18.80 (15.23, 22.99)
≥65	8.38 (8.02, 8.76)	4.30 (3.15, 5.84)	— ^b
Education ^a			
<High school	16.80 (16.21, 17.42)	17.16 (14.29, 20.47)	14.52 (11.16, 18.69)
High school or GED	39.15 (38.39, 39.91)	38.07 (34.35, 41.93)	45.74 (40.93, 50.64)
Some college	30.61 (29.91, 31.33)	29.07 (25.96, 32.38)	25.59 (21.49, 30.16)
College or more	13.43 (12.86, 14.03)	15.70 (13.10, 18.71)	14.15 (10.68, 18.52)
Region			
Northeast	16.68 (16.10, 17.27)	16.12 (13.59, 19.02)	9.48 (6.64, 13.36)
Midwest	25.83 (25.07, 26.60)	22.62 (19.63, 25.91)	32.16 (26.98, 37.82)
South	39.48 (38.58, 40.39)	43.50 (39.41, 47.67)	41.24 (36.19, 46.48)
West	18.02 (17.35, 18.70)	17.77 (15.03, 20.89)	17.12 (13.56, 21.39)
Cigarette smoking frequency, amount			
Someday smokers	19.89 (19.30, 20.49)	22.30 (19.52, 25.34)	34.26 (28.92, 40.03)
Daily smokers, 1–4 cpd	4.73 (4.38, 5.10)	5.39 (3.78, 7.63)	— ^b
Daily smokers, 5–14 cpd	32.87 (32.16, 33.59)	25.75 (22.81, 28.92)	24.58 (20.31, 29.42)
Daily smokers, 15–24 cpd	34.80 (34.14, 35.47)	36.15 (32.94, 39.48)	32.08 (27.40, 37.17)
Daily smokers, ≥25 cpd	7.72 (7.31, 8.15)	10.42 (8.35, 12.93)	6.73 (4.59, 9.77)
Time to first cigarette			
≤30 minutes	46.90 (46.13, 47.68)	49.79 (46.50, 53.10)	47.03 (41.72, 52.40)
>30 minutes	48.34 (47.59, 49.09)	45.59 (42.35, 48.87)	45.55 (40.31, 50.89)
It varies	4.76 (4.39, 5.16)	4.61 (3.33, 6.35)	7.43 (4.98, 10.93)
Usually smokes menthol			
Yes	30.52 (29.79, 31.25)	31.23 (27.98, 34.68)	19.51 (15.59, 24.12)
No	66.34 (65.60, 67.08)	64.01 (60.34, 67.52)	76.17 (71.22, 80.50)
No usual type	3.14 (2.82, 3.49)	4.76 (3.35, 6.71)	4.33 (2.56, 7.21)

CI = confidence interval; cpd = cigarettes per day; GED = general equivalency diploma; SLT = smokeless tobacco; wt% = weighted frequency.

^aRestricted to only those 25 years of age or older.

^bEstimates suppressed due to unreliability (relative standard error > 40%).

Association Between Tobacco Use Group and Use of Counseling or Medications for Cessation

Among people who reported trying to quit in the past year, tobacco use group was not associated in either bivariate or multivariable models with having used counseling or medication during the last quit attempt. Significant multivariable correlates of counseling or medication use included being female, being 25 years of age or older (vs. those 18–24 years of age), and being a daily smoker smoking 5 or more cpd (vs. a some day smoker). Those who were black or Hispanic had lower odds of reported use of counseling or medication than whites. Adjusting for interest in quitting and seriously considering quitting did not change the association between tobacco use group and use of counseling or medication.

Discussion

This study is among the first to use population-level data to assess the relationship between concurrent use of more than one tobacco

product and cigarette smoking quit attempts. Important findings from the multivariable analysis in this study are that dual users of cigarettes and SLT or cigarettes and cigars were just as likely as cigarette-only users to report having made a past year quit attempt, after adjusting for differences in demographic characteristics, smoking frequency and amount, and menthol cigarette use. Unfortunately, because of sample size limitations, we were unable to explore how these patterns of dual use relate to successful cessation or to examine users of other combinations of tobacco products.

Intentions to seriously consider quitting within the next 30 days or the next 6 months also did not differ between dual users and cigarette-only users. These findings differ from a previous analysis of 2009 Health Styles data by McClave-Regan et al., who observed that dual users of cigarettes and SLT were less likely to report planning to quit within the next 30 days than adults who only smoked cigarettes.¹³ It is possible that intention to quit may be increasing over

Table 2. Cigarette Smoking Cessation Behaviors Among Current Cigarette-Only and Dual Product Users, Tobacco Use Supplement to the Current Population Survey, 2010–2011

	Cigarette-only, wt% (95% CI)	Cigarette and cigar only, wt% (95% CI)	Cigarette and SLT only, wt% (95% CI)
	<i>n</i> = 24 206	<i>n</i> = 1061	<i>n</i> = 506
Ever tried to quit (% yes)	60.01 (59.09, 60.92)	63.50 (59.62, 67.20)	62.63 (57.55, 67.45)
Tried to quit in the past year (% yes)	37.42 (36.64, 38.20)	39.13 (35.88, 42.47)	43.94 (38.61, 49.43)
	<i>n</i> = 22 284	<i>n</i> = 937	<i>n</i> = 419
Tried to quit in the past year for 1 day or longer (% yes) ^a	36.60 (35.83, 37.38)	39.50 (36.12, 42.99)	45.65 (39.81, 51.61)
Seriously considering quitting	<i>n</i> = 23 163	<i>n</i> = 1015	<i>n</i> = 480
Within the next 30 days	16.75 (16.17, 17.35)	15.48 (13.02, 18.31)	18.49 (14.74, 22.94)
Within the next 6 months	22.94 (22.34, 23.56)	24.38 (21.48, 27.52)	23.16 (19.35, 27.47)
Not within the next 6 months	60.31 (59.48, 61.13)	60.15 (56.54, 63.64)	58.35 (53.29, 63.24)
Interest in quitting ^b	<i>n</i> = 23 793	<i>n</i> = 1047	<i>n</i> = 502
1 (not at all interested)	23.05 (22.21, 23.92)	26.39 (23.26, 29.78)	23.13 (19.25, 27.53)
2–5	32.39 (31.61, 33.18)	28.66 (25.19, 32.41)	31.25 (26.72, 36.16)
6–8	20.96 (20.30, 21.63)	23.68 (21.08, 26.49)	26.04 (22.20, 30.29)
9, 10 (extremely interested)	23.59 (22.89, 24.31)	21.26 (18.37, 24.48)	19.58 (15.91, 23.85)
Likelihood of succeeding if tried to quit in next 6 months ^c	<i>n</i> = 18 257	<i>n</i> = 762	<i>n</i> = 389
Not likely	11.11 (10.52, 11.73)	11.12 (8.64, 14.22)	7.27 (4.62, 11.27)
A little likely	22.15 (21.36, 22.96)	18.01 (15.28, 21.11)	14.93 (10.98, 19.97)
Somewhat likely	37.75 (36.88, 38.63)	40.16 (36.07, 44.39)	44.22 (37.60, 51.05)
Very likely	28.99 (28.18, 29.80)	30.70 (26.54, 35.20)	33.58 (28.14, 39.49)
No. of times tried to quit for 1 day or longer in past year ^{a,d}	<i>n</i> = 8273	<i>n</i> = 358	<i>n</i> = 188
1 time	32.56 (31.38, 33.75)	26.78 (21.92, 32.27)	33.97 (25.71, 43.34)
2–3 times	41.18 (39.91, 42.46)	39.84 (33.53, 46.51)	41.42 (33.83, 49.44)
≥4 times	26.27 (25.10, 27.47)	33.38 (27.36, 39.99)	24.61 (18.78, 31.54)
Length of last quit attempt ^{d,e}	<i>n</i> = 10 048	<i>n</i> = 438	<i>n</i> = 226
Less than 1 day	11.57 (10.90, 12.27)	11.76 (8.41, 16.19)	5.38 (2.65, 10.62)
1 to <7 days	36.81 (35.60, 38.03)	40.68 (35.27, 46.33)	39.84 (32.83, 47.28)
≥7 days, but <30 days	25.92 (24.89, 26.99)	24.76 (20.55, 29.50)	28.65 (22.14, 36.18)
≥30 days, but <6 months	19.18 (18.26, 20.14)	16.61 (12.82, 21.24)	18.90 (13.28, 26.19)
≥6 months	6.52 (5.92, 7.18)	6.20 (4.15, 9.16)	7.24 (4.13, 12.38)
Cessation methods last time tried to quit for 1 day or longer ^{d,f}	<i>n</i> = 10 404	<i>n</i> = 451	<i>n</i> = 234
Counseling ^g	5.57 (5.08, 6.09)	5.59 (3.65, 8.47)	1.72 (0.64, 4.54)
Medications ^h	32.02 (30.93, 33.13)	28.87 (24.40, 33.80)	24.61 (18.43, 32.04)
Either counseling or medication	33.46 (32.34, 34.60)	29.90 (25.34, 34.90)	25.33 (19.06, 32.84)
Both counseling and medication	4.09 (3.67, 4.55)	4.45 (2.81, 7.00)	0.99 (0.37, 2.68)

CI = confidence interval; GED = general equivalency diploma; SLT = smokeless tobacco; wt% = weighted frequency.

^aNot asked of current smokers who smoked <12 of the past 30 days, and those who quit <1 day.

^bAssessed on a 10-point scale where 1 = not at all interested and 10 = extremely interested. The ordinal 10-point variable was categorized in four categories based on quartiles.

^cNot asked of those who responded that they were not at all interested in quitting.

^dAmong those who tried to quit at least once in the past 12 months.

^eNot asked of current smokers who smoked <12 of the past 30 days.

^fNot asked of those who tried to quit for less than 1 day in the past 12 months.

^gIncludes quitline, clinician counseling, or class or program.

^hIncludes patch, gum, lozenge, inhaler, spray, Chantix, bupropion, or other cessation medications.

ⁱEstimates suppressed due to unreliability (relative standard error > 40%).

time among users of cigarette and SLT, and future studies should continue to examine trends in cessation measures among this group.

We also found that dual users were just as likely as cigarette-only users to have used cessation counseling or medications during their last smoking cessation attempt, after adjusting for covariates. However, the use of counseling and medication was still low among all groups (range: 2%–6% for counseling and 25%–32% for medication). Continuing to promote the use of evidence-based counseling and medications for cessation among all tobacco users—not just cigarette smokers—is critical because their use can improve the odds of successful quitting.^{14,17}

This study also identified important differences in demographic and smoking characteristics between dual users and cigarette-only users. Similar to other studies,¹³ dual users of cigarettes and SLT

were more likely to be male, white, young or middle-aged, and living in the Midwest. Demographics for dual users of cigarettes and cigars were also similar to previous research, with dual users in this group more likely to be male, black, and young or middle-aged.¹⁸ Demographic differences between dual users of cigarettes and SLT and dual users of cigarettes and cigars suggest they are unique populations. Demographic findings for both dual use groups mirror tobacco companies' targeted marketing, since tobacco companies market alternate, non-cigarette tobacco products to young adults, and have been shown to target black youth and young adults with cigar products, and white men with SLT products.^{1,6,11,19}

With regard to cigarette smoking behaviors, a significantly higher percentage of dual users of cigarettes and cigars, and

Table 3. Bivariate and Multivariable Logistics Regression Models with Correlates of Past Year Quit Attempts and Use of Cessation Counseling or Medications Among Current Tobacco Users

	Past year quit attempt ^a				Use of counseling or medications at last quit attempt ^b			
	Bivariate, <i>n</i> = 25 773		Multivariable, <i>n</i> = 25 333 ^c		Bivariate, <i>n</i> = 9858		Multivariable, <i>n</i> = 9716 ^c	
	OR (95% CI)	<i>P</i>	AOR (95% CI)	<i>P</i>	OR (95% CI)	<i>P</i>	AOR (95% CI)	<i>P</i>
Tobacco use group								
Cigarettes-only	Ref	.04	Ref	.33	Ref	.07	Ref	.57
Cigarette and cigar only	1.08 (0.93, 1.24)		1.08 (0.92, 1.26)		0.85 (0.66, 1.10)		0.99 (0.75, 1.32)	
Cigarette and SLT only	1.31 (1.05, 1.64)		1.16 (0.91, 1.48)		0.68 (0.46, 1.00)		0.82 (0.57, 1.19)	
Sex								
Male	Ref	.04	Ref	.70	Ref	<.0001	Ref	<.0001
Female	1.07 (1.00, 1.13)		1.01 (0.95, 1.08)		1.33 (1.21, 1.46)		1.34 (1.22, 1.48)	
Race/ethnicity								
White, non-Hispanic	Ref	<.0001	Ref	.02	Ref	<.0001	Ref	<.0001
Black, non-Hispanic	1.26 (1.12, 1.41)		1.02 (0.90, 1.15)		0.54 (0.45, 0.64)		0.61 (0.50, 0.74)	
Hispanic	1.14 (1.01, 1.29)		0.83 (0.73, 0.94)		0.40 (0.32, 0.51)		0.51 (0.41, 0.64)	
Other, non-Hispanic	1.21 (1.05, 1.40)		1.02 (0.87, 1.19)		0.79 (0.64, 0.98)		0.95 (0.76, 1.19)	
Age, years								
18–24	Ref	<.0001	Ref	<.0001	Ref	<.0001	Ref	<.0001
25–44	0.86 (0.77, 0.97)		0.93 (0.82, 1.05)		2.37 (1.96, 2.88)		2.34 (1.91, 2.87)	
45–64	0.72 (0.64, 0.81)		0.84 (0.74, 0.96)		3.50 (2.88, 4.26)		3.32 (2.70, 4.10)	
≥65	0.60 (0.51, 0.70)		0.70 (0.59, 0.82)		2.69 (2.09, 3.47)		2.41 (1.84, 3.16)	
Cigarette smoking frequency and amount								
Someday smokers	Ref ^d	<.0001	Ref	<.0001	Ref ^d	<.0001	Ref	<.0001
Daily smokers, 1–4 cpd	0.72 (0.63, 0.83)		0.74 (0.64, 0.85)		0.98 (0.74, 1.31)		1.05 (0.79, 1.40)	
Daily smokers, 5–14 cpd	0.61 (0.56, 0.66)		0.60 (0.55, 0.65)		1.51 (1.31, 1.74)		1.46 (1.26, 1.68)	
Daily smokers, 15–24 cpd	0.36 (0.33, 0.40)		0.36 (0.33, 0.39)		2.34 (2.02, 2.70)		2.01 (1.74, 2.32)	
Daily smokers, ≥25 cpd	0.24 (0.21, 0.27)		0.24 (0.21, 0.28)		3.23 (2.48, 4.19)		2.68 (2.06, 3.47)	
Usually smokes menthol								
Yes	1.17 (1.09, 1.25)	<.0001	1.05 (0.97, 1.13)	<.01	0.76 (0.68, 0.86)	<.0001	0.95 (0.83, 1.08)	.64
No	Ref ^e		Ref		Ref ^e		Ref	
No usual type	0.93 (0.78, 1.11)		0.77 (0.64, 0.94)		0.63 (0.46, 0.87)		1.05 (0.73, 1.50)	

AOR = adjusted odds ratio; CI = confidence interval; cpd = cigarettes per day; OR = odds ratio; Ref = reference group; SLT = smokeless tobacco.

^aReported trying to quit for 1 day or more within the past 12 months.

^bAssessed only among those who tried to quit in the past year.

^cSample size differs from bivariate data because only complete cases were used.

^dMissing <2% of data.

^eMissing <1% of data.

cigarette-only users (respectively) reported smoking menthol, compared to dual users of cigarettes and SLT. This finding may be because tobacco companies have targeted both cigar and menthol cigarette promotions to similar demographic groups (eg, young adults, Blacks). Finally, compared with cigarette-only users, a significantly higher percentage of dual cigarette and SLT users were some day (vs. daily) cigarette smokers. The prevalence of nondaily or some day smoking in the dual cigarette and SLT group in this study is higher than that of a recent study among adult males 25 years of age or older.³ Including the 18–24 year age range may increase the percentage of some day smokers because a higher proportion of young adults follow a nondaily smoking pattern.¹

This study is subject to several limitations. First, the data are cross-sectional and cannot be used to assess causality or temporality. For example, we were unable to determine when and why individuals added alternate tobacco products (eg, Were they cigarette smokers who added SLT or cigars? Or the reverse? Were the additional tobacco products added in an attempt to quit or reduce harm from cigarettes?) Second, sample size limitations precluded the assessment

of users of other combinations of tobacco products (eg, cigarettes, cigars, and SLT, cigarettes and hookah, cigarettes and pipe) and the assessment of the relationship between dual use and successful recent cessation. Future studies should seek to combine multiple years of data from other surveillance systems. Because the TUS-CPS is conducted every four years, we did not combine multiple years of data due to secular trends in product use.¹ Third, heterogeneity may exist within the dual use groups we assessed because both cigars and SLT include multiple products, each with potentially different use profiles. A more robust sample size is needed to assess differences in dual users of cigarettes and other specific products, such as snuff, snus, cigarillos, and little cigars. Furthermore, we could not assess use of electronic nicotine delivery systems because the CPS did not collect information about this product; people in any of the groups may have also been using electronic nicotine delivery systems. Fourth, cessation behaviors were assessed only among current smokers; we did not include former smokers or recent quitters in our sample (though only 6.6% of the sample were recent quitters). Our findings may therefore underestimate overall quit attempt rates. However, prior data suggest that those who tried to quit in the past

year and succeeded comprise a small percentage of people, compared to those who tried to quit and failed.²⁰ Fifth, findings from the cigarette and SLT group apply primarily to males because females made up only a small proportion of the sample. Future research with a larger sample is needed to produce female-specific estimates for this group. Limiting the analyses to males did not significantly change our results, and a sex $\times$ tobacco use group interaction term in the multivariable analyses was not significant. Finally, although dual users appear to attempt to quit at similar rates to cigarette-only users, we were unable to assess quit rates due to insufficient sample sizes. We were also unable to assess cessation of all tobacco products versus cessation of cigarette smoking only.

Despite these limitations, this study is among the first to assess and compare cigarette smoking cessation behaviors among the two most common dual use groups—those using cigarettes and cigars and those using cigarettes and SLT. Findings suggest that dual users are just as likely as cigarette-only users to intend to quit smoking cigarettes in the next 30 days and to report having tried to quit smoking at least once in the past year. Dual users were also just as likely as cigarette-only users to report use of counseling or medication when trying to quit smoking cigarettes. More research is needed to determine whether dual users are as likely as cigarette-only users to quit successfully. Use of other tobacco products (cigars or SLT) does not appear to affect attempts to quit cigarette smoking. Dual users are interested in cessation and are using effective treatment to support cessation attempts. However, use of effective treatments is still below optimal levels in both cigarette-only and dual user groups and should be increased.

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Declaration of Interests

None declared.

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