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Little Cigars and Cigarillos Use Among Young Adult Cigarette Smokers in the United States: Understanding Risk of Concomitant Use Subtypes

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Abstract

Introduction: In 2016, the Food and Drug Administration announced that it would regulate little cigars and cigarillos (LCCs) and expressed concern about the concomitant use of combustible tobacco products. To understand LCC use among socially-disadvantaged cigarette smokers, we assessed (1) the prevalence of concomitant use of subtypes of LCCs: LCC-tobacco, LCC-blunt, and LCC- poly use, which includes use of both LCC-tobacco and LCC-blunt and (2) and its association with sociodemographic factors and substance use behaviors using race/ethnicity and gender stratified models.

Methods: In 2015, a web-based survey was administered to a national probability sample of black/African American, Hispanic/Latino, and white cigarette smokers aged 18–44 (n = 1018). Weighted estimates were used to assess current LCC-tobacco, LCC-blunt, and LCC-poly use. Multinomial regression models assessed sociodemographic, other tobacco and substance use correlates associated with LCC user subtypes.

Results: Of cigarette smokers, 63% did not smoke LCCs; 15.1% were LCC-tobacco users; 11.1% were LCC-blunt users; and 10.5% were LCC-poly users. Black/African American and Hispanic/Latino cigarette smokers had higher odds of LCC-tobacco, LCC-blunt, and LCC-poly use compared to white cigarette smokers. Blacks/African Americans who initiated cigarette smoking before age 18 and smoked other tobacco products had greater odds of LCC-tobacco use than whites. Male cigarette smokers who smoked other tobacco products and females who had early onset of cigarette use also had greater odds of LCC-tobacco use.

Conclusions: Over 30% of cigarette smokers concomitantly used LCCs, which may prolong smoking. Accurate estimates of diverse LCC use behaviors may increase our understanding of the potential harms of concomitant use.

Implications: Aggregate measures of LCC smoking do not distinguish subtypes of use among socially-disadvantaged cigarette smokers (ie, young adults, blacks/African Americans, Hispanics/Latinos), who may engage in these unique smoking behaviors. We document the prevalence of young adult cigarette smokers who dual use LCC-tobacco and LCC-blunts and are poly users of LCC-tobacco + LCC-blunts, and identify sociodemographic groups at risk for use. The Food and Drug Administration is concerned about concomitant behavior, which may increase chronic disease risk and addiction. Accurate estimates of LCC smoking behaviors may increase our understanding of the harms of concomitant use; which can inform prevention programs that specifically target LCC subtypes.

Introduction

In 2009, the Family Smoking Prevention and Tobacco Control Act (FSPTCA) gave the Food and Drug Administration (FDA) the authority to regulate the manufacturing, distribution, and marketing of cigarettes. As a result, characterizing flavors in cigarettes (excluding menthol cigarettes) were banned to protect the public's health. In a landmark decision, in May 2016 the FDA announced that it would extend its regulatory authority to other tobacco products, including little cigars and cigarillos (LCCs), effective August 2016.[1] LCCs are typically flavored and are popular combustible tobacco products among young people.[2,3] Though the FDA will exert its authority over LCCs, they are still considerably less regulated than cigarettes (ie, can be sold in characterizing flavors, no marketing restrictions, etc.). Like cigarettes, LCCs are associated with an increased risk for chronic diseases including cancer and heart disease.[1] The concomitant use of LCCs and cigarettes is common among young adults[4,5] and may further increase the risk for chronic diseases,[6] secondhand exposure,[6,7] and addiction.[8]

The differential health risks associated with LCC use may depend how they are used. Unlike cigarettes, LCCs may be smoked as purchased (with its tobacco in the casing) or as a blunt. Blunts are cigars that have been modified by consumers who remove all or some the tobacco inside the casing and replace it with marijuana.[9] Blunts are also made by filling tobacco rolling paper with marijuana. LCC tobacco and blunt use are disproportionately high among non-Hispanic blacks,[10–15] males,[11,12] young adults,[10,11,16] and cigarette smokers,[11,12] which may result in early onset of nicotine and marijuana dependency and respiratory illnesses.[17–19] Thus, the dual use of cigarettes and LCCs in some racial/ethnic and gender groups may explain the disproportionate disease burden in these groups.

Prior studies have assessed LCC use among cigarette smokers,[4,10,11,20] but used an aggregate measure that did not distinguish unique LCC smoking behaviors (eg, with its tobacco or as blunts). To our knowledge, only one study separately assessed the prevalence and correlates of cigar-only, blunt-only, marijuana-only, and dual cigar and blunt smoking among a national representative sample of 54 309 adolescents and young adults who completed the National Survey of Drug Use and Health. Sixty-five percent of the sample was white and 23% were current tobacco users. Respondents who were younger, black/African American, and current tobacco, alcohol, or other drug users had higher odds of dual cigar and blunt use or blunt-only smoking.[21] This study assessed all cigar use behaviors, but did not distinguish LCC subtypes among groups at high risk for use. To our knowledge, no study has examined concomitant use of subtypes of LCCs (LCC-tobacco, LCC-blunt, and LCC-poly use, which includes both LCC-tobacco and LCC-blunt) among specific subgroups of cigarette smokers (ie, blacks/African Americans, Hispanics/Latinos) who may be more likely to engage in these unique smoking behaviors. Accurate estimates of LCC smoking behaviors may increase our understanding of the harms of concomitant use among these groups.

This study sought to assess the prevalence of LCC-tobacco, LCC-blunt, and LCC-tobacco + LCC-blunt (poly use) smoking using a national probability US sample of black/African American, Hispanic/Latino, and white young adult cigarette smokers. We examined the sociodemographic and substance use correlates of LCC-tobacco, LCC-blunt, and LCC-poly use using models stratified by race/ethnicity and gender to understand variations among socially-disadvantaged groups. Data from this study can be used to increase our understanding of the disproportionate burden of chronic diseases among some groups; inform future FDA regulatory policies and research related to LCCs; inform debates about the deregulation of marijuana in the United States; and inform the development of appropriate interventions for different types of LCC smokers, some of whom may be addicted to cigarettes, LCCs and/or marijuana.

Methods

Sample and Procedure

An online survey was used to collect LCC use behaviors and correlates associated with LCC subtypes using the probability-based GfK Knowledge Panel and an opt-in panel; which allowed us to obtain sufficient samples of black/African American, Hispanic, and white cigarette smokers, aged 18–44 years (n = 1018). We included 35–44 year olds to increase the sample size of smokers from different racial/ethnic groups and to compare LCC smoking behaviors among young adults who are also of childbearing age and have not yet reached middle age. GfK recruited equivalent numbers of participants across racial/ethnic groups to identify and compare variations in the patterns of LCC use. Among the 1018 cigarette smokers, 32.1% were black/African American, 32.4% Hispanic/Latino, and 35.5% white.

The survey consisted of two stages: initial screening for respondents' age and current smoking status and the main survey. Of the KnowledgePanel participants, 1477 were screened for this study and 42.3% (n = 625) completed the survey screener. Eighty-five percent of the KnowledgePanel (n = 532) were eligible for the main survey. The remaining participants (n = 486) came from the opt-in panel. The eligibility rate for the opt-in panel cases who were screened was 85.4%. Since GfK does not record how many invitations were sent out, we were unable to calculate the screener completion rate for the opt-in panel. However, GfK estimates that typical eligibility rates for the opt-in panel is 5%–8%. We compared the weighted demographics of the sample with current smokers from the Behavioral Risk Factor Surveillance System annual survey and found that the smoking rates for racial/ethnic groups by demographic factors (age, gender, education, and region) for each survey were similar. Current cigarette smokers were those who smoked at least 100 cigarettes in a lifetime and reported smoking "everyday" or "some days." The online survey was pretested and administered to the sample from May to June 2015.

Measures

Qualitative findings from our prior focus groups were used to modify established cigarette use measures and develop new LCC use measures that could capture subtypes of use among diverse groups.[22,23] Consistent with measurement development procedures,[24] all items were reviewed for face validity by the study team and a tobacco control expert review panel (n = 7).

Sociodemographics

We assessed respondents' age (18–24, 25–34, and 35–44 years), gender (male, female), race/ethnicity (white, black/African American, non-Hispanic, and Hispanic/Latino), level of education (less than high school, high school graduate, some college, and college graduate or advanced degree), household income (< $15 000, $15 000–40 000, $40 000–$75 000, and ≥$75 000), and employment status (working, not working but looking for work, and not working, not looking for work).

Cigarette Smoking Behavior

We assessed respondents' "age of cigarette smoking onset" by asking when they first smoked all or part of a cigarette. "Cigarette smoking frequency" was assessed by asking if they smoked cigarettes "every day" (daily) or "some days" (occasional). Respondents were also asked to report their "usual brand of cigarettes" smoked (mentholated, non-mentholated, no usual brand).

Current LCC Smoking Behavior

To define LCCs for respondents, an image of different types of LCCs was shown. Next respondents read the following: "This section asks about LITTLE CIGARS OR CIGARILLOS like those seen in the pictures. Some common brands are Black & Milds, Swisher Sweets Cigarillos, White Owl, but there are other brands." We included images and brand-specific names on the survey to improve estimates of use.[25] Respondents were asked if they ever tried LCC (yes/no). Respondents who reported no LCC use were considered "cigarette non-LCC smokers." Respondents who reported ever LCC use were then asked the following question to assess the type of LCC used at first use: "Did you smoke the LCC without marijuana (also known as weed, pot, loud, etc.) inside of it? (yes/no); with marijuana inside it? (yes/no); and with and without marijuana inside it? (yes/no)." Respondents who said they smoked LCCs without marijuana were considered "LCC-tobacco smokers"; those who smoked LCCs with marijuana inside were "LCC-blunt smokers"; and those who smoked both were "LCC-poly" (LCC-tobacco and LCC-blunt) smokers. Current LCC use was assessed by asking ever LCC use respondents if they now smoke LCC-tobacco, LCC-blunts, or LCC-tobacco and LCC-blunts daily, occasionally, or not at all.

Other Tobacco and Substance Use

Other tobacco use was assessed by asking respondents if they had smoked large cigars (yes/no), hookah tobacco (yes/no), or used e-cigarettes/tanks/vaporizers (yes/no) in the past 30 days. To differentiate between LCCs and large cigars, brand-specific large cigars names (ie, Arturo Fuente) were provided. Substance use was assessed by asking if respondents had smoked marijuana (not as a blunt) or drank alcohol at least once in the past 30 days (yes/no).

Analyses

All study data were weighted for age, gender, and race/ethnicity. We estimated the weighted prevalence of LCC-tobacco, LCC-blunt, and LCC-poly use for the overall sample, and by gender and racial/ethnic groups. Multinomial logistic regression analyses were conducted to determine the association of the sociodemographic, smoking and substance use characteristics among the LCC smoking subtypes for the overall sample and by gender and race/ethnicity.

Results

Current LCC Smoking Prevalence Among Current Cigarette Smokers

Sample descriptive statistics and the prevalence of the LCC subtypes among current cigarette smokers are presented in Table 1. Of the 1018 young adult cigarette smokers, 63% were cigarette, non-LCC smokers, 15% were LCC-tobacco, 11% were LCC-blunt, and 10% were LCC-poly users. Gender and smoking status were significantly associated ($p < .001$). Among males, the highest prevalence rate reported was cigarette, non-LCC use; over half reported use. With regard to LCC subtypes, among males, the prevalence of LCC-tobacco use was higher than that of LCC-blunt or LCC-poly use. Similar to males, the highest prevalence rate reported among females was cigarette, non-LCC use. Females reported a higher prevalence rate of LCC-blunt use than LCC-tobacco or LCC-poly use, however.

Race/ethnicity and smoking status were significantly associated ($p < .001$). Among whites, over 86% reported cigarette, non-LCC smoking. For whites, the prevalence of LCC combined use (LCC-tobacco, LCC-blunt, and LCC-poly use combined) was 13.6%; the highest prevalence reported was for LCC-tobacco use. In contrast to whites, the prevalence of cigarette, non-LCC use among black/African Americans was 51.9%. The prevalence of LCC combined use among blacks/African Americans was 48.1%; the highest prevalence rate reported was for LCC-tobacco use. Roughly half of Hispanic/Latinos smoked cigarettes, non-LCCs. The prevalence of LCC combined use among Hispanics was 50.7%; the highest prevalence rate was for LCC-blunt use.

Usual cigarette brand, other tobacco product use and marijuana use were also significantly associated with smoking status ($ps < .001$). Almost 61% of menthol cigarette smokers were cigarette, non-LCC users and 39.1% reported LCC combined use. Menthol smokers reported higher prevalence rates of LCC-tobacco and LCC-blunt use than LCC-poly use. Among those who reported other tobacco product use (including 8.5% large cigar users; 10.2% hookah users, 21.5% e-cigarettes users, and 14.2% vaporizer/tank system/e-hookah users), over 47% reported cigarette, non-LCC use, while 52.5% reported LCC combined use. LCC-tobacco use had the highest prevalence rate among other tobacco users, and was reported by approximately one-fourth of those smokers. In contrast, 61% of past 30-day marijuana users reported any LCC-use. Past 30-day marijuana users reported higher prevalence rates of LCC-blunt and LCC-poly use than LCC-tobacco use.

Current LCC Smoking Prevalence by Gender

The gender-specific prevalence of current LCC use is presented in Table 2. Though data are also presented for cigarette, non-LCC use, only the prevalence rates of the LCC use subtypes are described below.

Men

Significant associations were found for race/ethnicity, cigarette smoking frequency, usual cigarette brand smoked, other tobacco and marijuana use, and smoking status ($ps < .001$). Across each racial/ethnic group, the prevalence of LCC-tobacco use was higher than that of LCC-blunt and LCC-poly use. Similarly, daily and occasional smokers reported higher prevalence rates of LCC-tobacco use than LCC-blunt or LCC-poly use. Menthol and non-menthol cigarette smokers had higher prevalence of LCC-tobacco use; those who smoked no usual brand had a higher prevalence of LCC-poly use, however. Other tobacco product users had higher prevalence of LCC-tobacco than the other LCC subtypes. Marijuana users had higher prevalence rates of LCC-poly and LCC-blunt use, however.

Women

Significant associations were found for race/ethnicity, cigarette smoking frequency, other tobacco and marijuana use, and smoking status ($ps < .001$). Among white females, the prevalence of LCC-tobacco use was higher than other LCC subtypes. The prevalence of LCC-blunt use was highest among black/African American and Hispanic/Latino females, however. Daily cigarette smokers reported

Table 1. Prevalence of Current Cigarette and LCC Smoking Among US Current Cigarette Smokers, Aged 18–44 (n = 1018)

Characteristics	Total sample[a] (n = 1018)	Cigarette, non-LCC smokersb (n = 644)	LCC-tobacco smokersb (n = 154)	LCC-blunt smokersb (n = 113)	LCC-poly usersb (n = 107)	p
Prevalence		**63.1**	**15.1**	**11.1**	**10.5**	
Age						**
18–24	**22.8**	55.3	17.1	13.1	14.5	
25–34	**44.1**	63.3	15.4	9.5	11.8	
35–44	**33.1**	68.9	13.4	11.7	6.1	
Gender						***
Male	**59.6**	59.4	18.1	8.8	13.6	
Female	**40.4**	69.0	10.7	14.3	6.0	
Race/ethnicity						***
White, non-Hispanic	**35.5**	86.4	8.4	2.5	2.7	
Black, non-Hispanic	**32.1**	51.9	20.2	12.9	15.0	
Hispanic	**32.4**	49.3	17.4	18.5	14.7	
Education						**
Less than high school	**25.5**	57.5	12.2	14.3	16.0	
High school	**35.4**	64.7	18.1	10.4	6.8	
Some college	**30.3**	65.2	14.4	10.0	10.4	
Bachelor's degree or higher	**8.8**	67.8	14.3	7.8	10.2	
Household income						**
Less than $15 000	**30.1**	64.3	14.7	10.6	10.3	
$15 000–$40 000	**30.4**	65.1	10.4	12.3	12.2	
$40 000–$75 000	**21.5**	66.0	17.6	12.6	3.8	
$75 000 or more	**18.0**	55.9	21.4	9.9	12.7	
Current employment status						
Working	**56.4**	64.7	15.5	10.0	9.9	
Not working, looking	**20.9**	60.3	14.8	10.6	14.4	
Not working, not looking	**22.7**	62.7	14.6	14.1	8.6	
Cigarette smoking frequency						
Every day	**68.4**	62.8	14.6	11.4	11.2	
Some days	**31.6**	64.3	16.2	10.4	9.1	
Usual cigarette brand						***
Menthol	**52.4**	60.9	14.9	13.4	10.8	
Non-menthol	**43.2**	69.1	13.8	8.6	8.5	
No usual brand	**4.4**	42.5	20.0	8.7	28.9	
Age of cigarette onset						*
≤14 y	**38.4**	58.7	15.3	14.3	11.7	
15–17	**31.9**	69.7	13.1	8.2	9.0	
≥18 y	**29.7**	62.0	17.1	10.0	10.9	
Past 30-day other tobacco use						***
Yes	**32.3**	47.5	24.1	12.9	15.6	
No	**67.7**	70.8	11.0	10.2	8.0	
Past 30-day marijuana use						***
Yes	**24.8**	39.0	14.2	26.1	20.8	
No	**75.2**	74.4	16.0	4.1	5.5	
Past 30-day alcohol use						*
Yes	**75.4**	60.9	16.1	11.8	11.2	
No	**24.6**	70.9	12.0	9.2	7.9	

LCC = little cigars and cigarillo.

The significance values for the bold values are the same as those provided in the last column of the table.

[a]Percentages are column percentages.

[b]Percentages are row percentages.

*p < .05; **p < .01; ***p < .001.

a higher prevalence of LCC-blunt use, whereas occasional smokers reported a higher prevalence of LCC-tobacco use. Other tobacco and marijuana users reported a higher prevalence rate of LCC-blunt use than other LCC subtypes.

Current LCC Smoking Prevalence by Race/Ethnicity

Whites

The racial/ethnic group-specific prevalence of LCC use is presented in Table 3. For whites, significant associations were found for gender, cigarette smoking frequency, other tobacco and marijuana use, and smoking status. For males and females, the prevalence of LCC-tobacco use was higher than other LCC subtypes. Among daily and occasional cigarette smokers, the prevalence of LCC-tobacco use was higher than other LCC subtypes. Other tobacco users also had higher prevalence rate of LCC-tobacco use than other LCC subtypes. In contrast, marijuana users had higher prevalence rates of LCC-blunt and LCC-poly use than LCC-tobacco use.

Table 2. Prevalence of Current Cigarette and LCC Smoking Among US Current Cigarette Smokers, Aged 18–44 (n = 1018), by Gender

	Total sample (n = 1018)								
	Past 30-day male smokers (N = 607)					Past 30-day female smokers (N = 411)				
Characteristics	Cigarette, non-LCC smokers[a] (n = 361)	LCC-tobacco smokers (n = 110)	LCC-blunt smokers (n = 54)	LCC-poly users (n = 82)	p	Cigarette, non-LCC smokers (n = 284)	LCC-tobacco smokers (n = 44)	LCC-blunt smokers (n = 59)	LCC-poly users (n = 24)	p
Prevalence	59.4	18.1	8.8	13.6		69.0	10.7	14.3	6.0	
Age										
18–24	53.1	18.0	11.8	17.1		59.7	15.3	15.5	9.5	
25–34	60.5	18.9	5.8	14.8		67.3	10.3	14.9	7.6	
35–44	63.1	17.1	10.7	9.2		76.3	8.7	13.0	2.1	
Race/ethnicity					***					***
White, non-Hispanic	85.3	9.3	0.8	4.6		87.7	7.3	4.7	0.4	
Black, non-Hispanic	43.4	26.2	11.9	18.5		63.1	12.3	14.3	10.3	
Hispanic	49.9	19.1	13.4	17.6		48.1	13.9	29.3	8.8	
Education										
Less than high school	54.5	14.4	8.7	22.4		61.2	9.5	21.1	8.2	
High school	59.4	21.8	9.8	8.9		74.5	11.2	11.4	2.9	
Some college	62.8	16.1	8.4	12.7		68.7	11.9	12.3	7.1	
Bachelor's degree or higher	61.3	18.7	6.2	13.9		76.1	8.5	9.9	5.5	
Household income					**					
Less than $15 000	58.7	15.8	12.2	13.2		71.3	13.3	8.7	6.7	
$15 000–$40 000	63.1	12.8	8.9	15.2		67.3	7.7	16.2	8.8	
$40 000–$75 000	64.1	23.4	8.2	4.3		69.4	7.0	20.6	3.0	
$75 000 or more	54.3	22.9	6.2	16.6		60.2	17.6	19.5	2.7	
Current employment status										
Working	61.7	18.7	8.2	11.3		70.2	9.3	13.4	7.1	
Not working, looking	56.4	14.9	11.36	17.2		67.2	14.6	8.8	9.4	
Not working, not looking	54.8	20.3	7.5	17.5		68.3	10.5	18.8	2.3	
Cigarette smoking frequency					***					***
Every day	54.8	20.3	9.8	15.0		73.5	7.0	13.4	6.1	
Some days	68.2	13.9	7.0	10.9		57.1	20.6	16.7	5.6	
Usual cigarette brand					***					
Menthol	56.6	18.8	11.8	12.7		66.6	9.6	15.6	8.2	
Non-menthol	66.8	15.7	6.0	11.5		72.8	10.6	12.9	3.6	
No usual brand	31.2	19.6	5.8	43.3		64.4	20.7	14.2	0.7	
Age of cigarette onset					*					
≤14 y	55.8	16.7	11.8	15.7		62.5	13.5	17.7	6.3	
15–17	66.4	14.2	7.8	11.6		75.3	11.1	9.0	4.6	
≥18 y	55.5	24.2	6.6	13.6		71.5	6.5	15.1	6.9	
Past 30-day other tobacco use					***					***
Yes	44.1	30.5	6.4	19.0		52.9	13.8	23.2	10.1	
No	67.0	12.0	9.7	11.3		76.4	9.7	10.8	3.2	
Past 30-day marijuana use					***					***
Yes	35.7	18.6	22.5	23.2		44.7	6.5	32.2	16.6	
No	70.5	18.5	1.9	9.1		79.5	12.6	7.1	0.7	
Past 30-day alcohol use										***
Yes	58.7	18.2	9.1	14.0		64.5	12.8	16.0	6.7	
No	60.9	17.6	8.5	12.9		83.1	5.1	10.1	1.7	

LCC = little cigars and cigarillo.

[a]Categories of cigarette smokers and LCC smoking groups are mutually exclusive. Poly users are persons who are LCC-tobacco and LCC-blunt users.

*p < .05; **p < .01; ***p < .001.

Blacks/African American

For blacks/African Americans, significant associations were found for gender, cigarette smoking frequency, usual cigarette brand smoked, other tobacco and marijuana use, and smoking status. Males had a higher prevalence of LCC-tobacco use than LCC-blunt or LCC-poly use. Females had a higher prevalence rate of LCC-blunt use, however. Daily cigarette smokers had a higher prevalence rate of LCC-poly use, whereas occasional smokers reported a higher prevalence rate of LCC-tobacco use. Menthol cigarette smokers also reported a higher rate of LCC-poly use, whereas non-menthol and no usual brand smokers reported a higher prevalence rate of LCC-tobacco use. Other tobacco product users reported a higher prevalence of LCC-tobacco use, whereas marijuana users reported a higher prevalence rate of LCC-poly use.

Table 3. Prevalence of Current Cigarette and LCC Smoking Among US Current Cigarette Smokers, Aged 18–44 (n = 1018), by Race/Ethnicity

	White (n = 361)					Black (n = 327)					Hispanic (n = 320)				
Characteristics	Cigarette, non-LCC smokers[a] (n = 312)	LCC-tobacco smokers (n = 30)	LCC-blunt smokers (n = 9)	LCC-poly users (n = 10)	p	Cigarette, non-LCC smokers (n = 170)	LCC-tobacco smokers (n = 66)	LCC-blunt smokers (n = 42)	LCC-poly users (n = 49)	p	Cigarette, non-LCC smokers (n = 163)	LCC-tobacco smokers (n = 58)	LCC-blunt smokers (n = 61)	LCC-poly users (n = 48)	p
Total	86.4	8.4	2.5	2.7		51.9	20.2	12.9	15.0		49.3	17.4	18.5	14.7	
Age					*					***					
18–24	78.6	12.9	5.7	2.8		26.9	25.1	19.6	28.4		50.9	15.9	16.3	16.9	
25–34	85.7	9.0	2.8	2.4		60.5	15.4	8.0	16.1		43.3	21.8	17.8	17.1	
35–44	92.8	4.4	0.0	2.9		53.2	23.9	15.8	7.1		57.4	11.9	21.7	9.0	
Gender					**					***					**
Male	85.3	9.3	0.8	4.6		43.4	26.2	11.9	18.5		49.9	19.1	13.4	17.6	
Female	87.7	7.3	4.7	0.4		63.1	12.3	14.3	10.3		48.1	13.9	29.3	8.8	
Education					*					***					*
Less than high school	90.9	0.0	4.1	5.0		65.5	8.5	3.1	22.9		33.3	21.5	28.0	17.1	
High school	82.3	12.1	2.2	3.5		48.6	27.1	15.3	9.0		61.6	15.0	15.1	8.3	
Some college	86.2	10.8	1.9	1.1		49.3	19.2	17.0	14.6		53.8	14.1	13.6	18.6	
Bachelor's degree or higher	93.2	2.5	3.1	1.2		32.2	29.2	18.2	20.5		56.3	21.1	6.2	16.5	
Household income										***					***
Less than $15 000	86.5	6.7	1.2	5.5		66.3	19.9	10.5	3.4		37.4	13.1	20.8	28.7	
$15 000–$40 000	89.2	6.3	2.6	1.9		40.9	14.4	13.2	31.6		54.5	12.4	23.1	10.0	
$40 000–$75 000	88.2	11.3	0.5	0.0		48.5	21.6	23.0	6.9		52.3	22.0	19.5	6.2	
$75 000 or more	80.41	10.0	5.7	3.8		12.1	36.2	18.5	33.2		48.7	28.6	10.4	12.3	
Current employment status															*
Working	86.5	8.8	3.1	1.6		50.8	16.6	14.6	18.0		48.8	23.4	14.8	13.0	
Not working, looking	81.2	7.8	2.6	8.3		48.5	25.1	9.7	16.7		58.0	7.6	18.0	16.4	
Not working, not looking	89.9	7.6	0.74	1.8		58.4	22.9	12.9	5.8		43.3	13.6	26.4	16.8	
Cigarette smoking frequency					***					**					***
Every day	89.4	5.1	3.2	2.3		47.2	19.1	14.8	19.0		42.0	23.2	19.2	15.5	
Some days	75.5	20.3	0.0	4.2		60.9	22.3	9.4	7.4		60.6	8.6	17.4	13.5	
Usual cigarette brand										***					**
Menthol	82.9	11.9	3.5	1.6		56.5	14.8	12.7	16.0		50.5	17.4	22.2	9.9	
Non-menthol	87.8	6.8	2.1	3.3		51.4	30.0	13.4	5.2		47.5	18.4	16.6	17.5	
No usual brand	100.0	0.0	0.0	0.0		5.1	38.9	20.2	35.7		55.2	8.8	0.0	36.0	
Age of cigarette onset															***
≤14 y	83.9	9.0	4.9	2.2		51.6	17.1	13.7	17.6		29.6	22.7	27.6	20.1	
15–17	86.2	9.1	0.6	4.1		43.7	22.9	16.5	17.0		75.4	7.8	9.8	7.0	
≥18 y	93.6	5.4	0.0	0.9		58.6	20.0	9.7	11.7		49.0	19.8	15.9	15.4	
Past 30-day marijuana use (% yes)					***					***					***
Yes	71.9	6.5	10.5	11.0		26.3	174.2	26.4	30.1		27.5	16.7	36.7	19.1	
No	90.7	9.3	0.0	0.0		64.9	22.2	5.9	7.1		62.4	18.5	7.8	11.3	
Past 30-day alcohol use										***					
Yes	84.4	9.36	3.4	2.9		45.1	21.3	14.7	18.9		51.5	18.3	17.8	12.5	
No	91.6	6.2	0.0	2.2		74.0	15.4	7.6	3.1		43.9	15.2	21.5	19.4	
Past 30-day other tobacco use					***					***					***
Yes	75.9	11.5	7.2	5.4		33.0	29.5	15.8	21.7		35.3	30.3	15.3	19.1	
No	90.7	6.9	0.74	1.6		59.9	16.2	11.8	12.0		58.8	10.2	19.7	11.2	

LCC = little cigars and cigarillo.

[a]Categories of cigarette smokers and LCC smoking groups are mutually exclusive. Poly users are persons who are LCC-tobacco and LCC-blunt users.

*p < .05; **p < .01; ***p < .001.

Hispanics/Latinos

For Hispanics/Latino, significant associations were found for gender, cigarette smoking frequency, usual cigarette brand smoked, age of cigarette use onset, other tobacco and marijuana use, and smoking status. Males reported higher prevalence of LCC-tobacco and LCC-poly use, whereas females reported higher prevalence of LCC-blunt use. Daily smokers reported higher prevalence of LCC-tobacco, while occasional smokers reported higher prevalence of LCC-blunt

use. Menthol smokers also reported higher prevalence of LCC-blunt use, non-menthol smokers reported a higher prevalence of LCC-tobacco, and no usual brand smokers reported a higher prevalence of LCC-poly user. Hispanic/Latinos who initiated cigarette smoking before age 17 had higher prevalence rates of LCC-blunt use, whereas those who initiated smoking after age 18 had higher prevalence of LCC-tobacco use. Other tobacco users had higher prevalence rate of LCC-tobacco use, whereas marijuana smokers had a higher prevalence rate of LCC-blunt use.

Correlates of Current LCC Smoking Behavior

The correlates of LCC-tobacco, LCC-blunt, and LCC-poly use compared to cigarette non-LCC use are presented in the Supplementary Table 1. Though we stratified our models by gender and racial/ethnic groups, some models had small subgroup sample sizes and resulted in inflated point estimates. We report findings of models that had sufficient power to detect a difference.

Total Sample

Black/African American and Hispanic/Latino cigarette smokers compared to whites; males compared to females; smokers with early onset of cigarette use compared to late onset; and smokers who reported other tobacco use compared to no other tobacco use had greater odds of LCC-tobacco smoking.

Gender

Among males, black/African American and Hispanic/Latino cigarette smokers compared to whites; daily smokers compared to occasional smokers; and other tobacco users compared to smokers who did not use other tobacco had greater odds of LCC-tobacco use. Among females, black/African American and Hispanic/Latino cigarette smokers compared to whites; smokers with early onset of cigarette use compared to smokers with late onset; and other tobacco users compared to smokers who did not use other tobacco had increased odds of LCC-tobacco use. Female daily smokers compared to occasional smokers had lower odds of LCC-tobacco use.

Race/Ethnicity

Among whites, daily cigarette smokers compared to occasional users had lower odds of LCC-tobacco use. Among blacks/African Americans, smokers with early onset of cigarette use compared to late onset; other tobacco users compared to smokers who did not use other tobacco; and marijuana and alcohol users compared to nonusers had greater odds of LCC-tobacco use. Among Hispanics/Latinos, males compared to females; daily cigarette smokers compared to occasional smokers; and other tobacco users compared to nonusers had greater odds of LCC-tobacco. Menthol cigarette smokers compared to non-menthol smokers, and smokers with an early onset of cigarette use compared to late onset of use had lower odds of LCC-tobacco use.

Correlates of LCC-Blunt Use

Total Sample

Black/African American and Hispanic/Latino cigarette smokers; smokers with an early onset of cigarette use; and marijuana users had greater odds of LCC-blunt use than their comparison groups.

Gender

Among males, daily cigarette smokers and marijuana users had greater odds of LCC-blunt use than their comparison groups. Among females, early onset of cigarette use, other tobacco use, and marijuana users had increased odds of LCC-blunt use than their comparison groups. Female daily cigarette smokers had lower odds of LCC-blunt use than occasional smokers. Black/African American and Hispanic/Latino cigarette smokers had greater odds of LCC-blunt use than whites among both genders. However, the confidence interval for the point estimates were wide due to small cell sizes.

Race/Ethnicity

We were unable to report the associations between the sociodemographic and substance use variables and LCC-blunt among whites because of small subgroup sizes. Among blacks/African Americans, daily cigarette smokers; early cigarette use initiators; and marijuana users had a greater odds of LCC-blunt use than their comparison groups. Among Hispanics/Latinos, marijuana users had a greater odds of LCC-blunt use than persons who did not use marijuana. Alcohol users and early initiators of cigarette use had lower odds of LCC-blunt use than their comparison groups.

Correlates of LCC-Poly Use

Total Sample

Black/African American and Hispanic/Latino, males, those who reported no usual cigarette brand, and marijuana users had increased odds of poly use than their comparison groups.

Gender

Among males, black/African American and Hispanic/Latino, daily cigarette users, smokers who report no usual cigarette brand, other tobacco use, and marijuana use was associated with greater odds of LCC-poly use than their comparison groups. Among females, blacks/African Americans, Hispanics/Latinos and marijuana users had higher odds of LCC-poly use; however the point estimates were inflated due to small subgroup sizes.

Race/Ethnicity

Among blacks/African Americans, early onset of cigarette use, menthol smoking, other tobacco use, and marijuana and alcohol use was associated with greater odds of LCC-poly use. Among Hispanics/Latinos, males, other tobacco users, and marijuana users had greater odds of LCC-poly use than their comparison groups. Early onset of cigarette use, menthol cigarette smoking and alcohol use was associated with lower odds of LCC-poly use than their comparison groups.

Discussion

Our study contributes to a growing body of evidence that indicates that young adult cigarette smokers are at greater risk for concomitant LCC use. The data also showed that 15.1% of cigarette smokers used LCC-tobacco, 11.1% used LCC-blunts, and 10.5 % were LCC-poly users. To our knowledge, this study is the first to document the prevalence of these unique LCC smoking behaviors among a national probability sample with equivalent numbers of blacks/African Americans, Hispanics/Latinos, and white smokers. Our combined dual cigarette and any LCC use rate of 36.7% is comparable to rates of past 30-day dual LCC and cigarette use reported in other studies.[4,5,10,11,20,26]

Black/African American and Hispanic/Latino cigarette smokers were more likely than whites to be LCC-tobacco, LCC-blunt, and LCC-poly users. The increased risk for dual use of any subtype of

LCCs among cigarette smokers from socially-disadvantaged racial/ethnic groups is concerning. Dual tobacco use may play an important role in the maintenance of cigarette smoking and addiction among black young adults, who are less likely to successfully quit smoking.[27] Dual use may also help to explain the elevated tobacco-caused disease risk among black/African American smokers, who are more likely to smoke fewer cigarettes than whites.[27] Our study suggests that new models of disease risk among blacks/African Americans and Hispanics/Latinos should be explored to determine the role of dual use in chronic disease onset and disproportionate tobacco-caused morbidity and mortality.

Compared to females, male cigarette smokers had significantly greater odds of LCC-tobacco and LCC-poly use, but not LCC-blunt use. Males in general have higher tobacco use rates than females.[28] These data, combined with data that show that males have higher dual use rates than females, may help to explain higher rates of tobacco-caused disease risk seen among males. Male daily cigarette smokers were more likely, whereas female daily cigarette smokers were less likely, to smoke LCC-tobacco or LCC-blunts. Perhaps differences observed in blunt use may be due to the threshold differences of nicotine tolerance.[29] Thus, women's lower nicotine tolerance may result in blunt use whereas men's higher nicotine tolerance may result in LCC-poly use. Gender differences may also be due to a lack of cultural and social acceptance of dual product use among women or the culture of tobacco use among men.[30] These findings suggest the need to further examine how these gender differences in dual use influence quit rates and nicotine dependence among young adults.[31]

Consistent with a prior study,[5] we found that, in general, smokers who initiate cigarette use before age 18 had greater odds of LCC-tobacco and blunt smoking. This was also true for females. However, black/African American cigarette smokers who initiated between ages 15 to 17 had greater odds of LCC-tobacco, LCC-blunt, and LCC-poly use, whereas Hispanic/Latino smokers had lower odds. This relationship was not significant for whites. Age of onset of cigarette smoking may pose differential risk for some racial/ethnic groups. Prevention programs may need to be tailored for different age groups among some races/ethnicities.

Other tobacco product use, marijuana and alcohol use is associated with dual use behaviors among some groups.[5,32] Cigarette smokers who used other tobacco products (large cigars, hookah and e-cigarettes) had greater odds of LCC-tobacco use. Like LCCs, large cigars, hookah tobacco, and e-cigarettes are often flavored. Though the FDA has regulatory authority over these products, they are still available in characterizing flavors. Flavors mask the harshness, bitterness, and irritation of nicotine and may appeal to younger smokers[33–35]; of whom 53.3% of our sample smoked a mentholated brand. Lack of regulation has provided the tobacco industry an unprecedented, unobstructed opportunity to market these flavored tobacco products to vulnerable populations.

Current marijuana users had higher odds of LCC-blunt and poly use. Though some young adults perceive that marijuana use in any form is "natural,"[23] combined use of marijuana and tobacco can increase the risk of nicotine and marijuana dependency and other health effects. This is concerning for minority racial/ethnic groups since regular marijuana use can increase social disadvantage and mobility in middle age.[36,37] Future studies should examine the potential unintended consequences of marijuana legalization on concomitant use of LCCs.

Our study had several limitations. The cross-sectional design does not allow us to assess temporal associations related to substance use. Our sample did not include Asian, American Indian and Alaska Native, Native Hawaiians or Other Pacific Islanders due to the GfK panel design. We were unable disaggregate ethnic categories (eg, Caribbean-born blacks, Mexicans, etc.) to examine within-group differences. We did not include frequency of LCC use in our models since the measurement of this variable is problematic. While our measures may have reduced misclassification and provided more precise measures of LCC subtypes, misclassification among LCC subtypes is a possibility. Due to limitations on the number of survey questions, we did not assess smokeless tobacco, use of dissolvables, bidis, or kreteks.

Despite these limitations, our study has several strengths. Our study includes sufficient samples of blacks/African Americans and Hispanics/Latinos, the two largest minority ethnic groups in the nation. Our assessment of LCC use captured diverse use of the product. Thus, our data support incorporating measures that capture diverse patterns of LCC smoking behavior in national tobacco surveillance systems.

In conclusion, over 35% of young adult cigarette smokers in our sample used LCCs concomitantly. The FDA is concerned about dual tobacco use, as it may prolong tobacco and increase the risk for chronic disease. Studies are needed to better understand the abuse liability of dual cigarette and LCC use compared to cigarette, non-LCC use and elevated health risks associated with dual use. Finally, our findings indicate that interventions for different groups of LCC smokers are warranted to prevent or reduce the risk of exposure to tobacco-related toxins, nicotine and/or marijuana dependency, and encourage quitting.

Supplementary Material

Supplementary Table 1 can be found online at http://www.ntr.oxfordjournals.org

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Declaration of Interests

None declared.

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