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Knowledge and beliefs about blunts among youth in the United States

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ABSTRACT

Background: Blunts (i.e., cannabis rolled in cigar paper with or without tobacco) are a popular way of consuming cannabis. Little survey research has examined knowledge and beliefs about blunts, especially among youth who use cigars or are susceptible to cigar use.

Methods: Participants were a convenience sample of $N = 506$ youth (ages 15–20) from the United States (US) recruited April-June 2023 who reported ever using little cigars or cigarillos (LCCs), past 30-day use of LCCs, or susceptibility to using LCCs. We used adjusted logistic and ordinal regression models to examine correlates of knowledge that blunts contain nicotine and, separately, relative addiction/harm perceptions for blunts vs. unmodified cigars containing only tobacco.

Results: One-third of youth (32.1 %) thought that blunts do not contain nicotine. Around half of youth thought that blunts were "much less" or "slightly less" addictive (45.0 %) and "much less" or "slightly less" harmful (51.5 %) than unmodified cigars. Youth who identified as Black/African American (vs. white) had lower odds of knowledge that blunts contain nicotine ($aOR = 0.51$, 95 % CI: 0.30, 0.87). Youth who frequently used blunts were less likely to report that blunts were more addictive ($aOR = 0.39$; 95 % CI: 0.24, 0.63) and harmful ($aOR = 0.31$; 95 % CI: 0.19, 0.50 (vs. unmodified cigars) compared with youth who never used blunts.

Conclusions: Our study with a sample of US youth—who have used or are susceptible to using LCCs—found that about 1 in 3 participants thought that blunts do not contain nicotine, and many believed blunts were less harmful and addictive than unmodified cigars.

1. Introduction

Blunts (i.e., cannabis rolled in cigar paper with or without tobacco) have become a popular way of consuming cannabis among youth in the United States (US) (Jensen et al., 2024), and in 2022, 11.6 % of high school students reported ever smoking a blunt (Jebai et al., Manuscript under review). The long-term health risks of smoking blunts are not known. However, research has shown that blunts can expose people to more carbon monoxide than other forms of combustible cannabis use, such as joints (Cooper and Haney, 2009). Blunts can also contain nicotine even if the tobacco filler is completely removed due to tobacco in the cigar leaf wrapper (Peters et al., 2016). In addition, blunt use is associated with both nicotine and cannabis dependence (Schauer et al., 2017) and subsequent cigar use (Audrain-McGovern et al., 2019) and other tobacco product use (e.g., cigarettes) (Fairman et al., 2023; Mayer et al., 2020). The health risks of blunt smoking are also potentially similar to other combustible cannabis products, which generally are associated with worsened respiratory symptoms, more frequent chronic bronchitis symptoms, and lower birth weight of offspring when used during pregnancy (National Academies of Sciences, Engineering, and Medicine, 2017). Cannabis use more generally (not specific to combustible cannabis use) is also associated with the development of schizophrenia and other psychoses, suicidal ideation, impairments in cognitive domains, and increased risk of motor vehicle crashes (National

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Academies of Sciences, Engineering, and Medicine, 2017).

While blunt use is associated with health risks, many consumers do not perceive blunt use as harmful to their health, particularly when compared with other tobacco products, which could be because cannabis can confer some medicinal benefits (National Academies of Sciences, Engineering, and Medicine, 2017) while commercial tobacco does not. In a 2017 systematic review, Schauer et al. identified six studies on perceptions of risk and addiction to co-administered tobacco and cannabis products, such as blunts (Schauer et al., 2017). These six studies, which were all qualitative, found that people perceived co-administered products, like blunts, as less harmful, less addictive, and more natural than tobacco (Schauer et al., 2017). For instance, in one of the studies, the authors proposed a continuum of risk perceptions whereby participants viewed cigarettes as more harmful, flavored little cigars and cigarillos without cannabis as harmful but not as harmful as cigarettes, and blunts as less harmful (Sterling et al., 2016). While people may view blunts as less risky than other tobacco products, it is still important to note that people who use blunts do acknowledge some level of harm from using cigarillos in some form, with 29.5 % of blunt smokers in a previous study reporting that smoking cigarillos was extremely harmful (Timberlake and Rhee, 2022). People also hold misperceptions about whether blunts contain nicotine. For instance, in a recent qualitative study of adults who smoke little cigars or cigarillos, some participants who only used the cigar wrappers were not concerned about the nicotine content because they believed that nicotine was only present in the tobacco leaf filler and not the wrapper (Hackworth et al., 2023).

While several qualitative studies have been conducted on perceptions of blunts, little survey research among youth exists. Focusing on youth is important because youth are more likely than those of older ages to exclusively use cigars as blunts (Jensen et al., 2024). Previous quantitative studies among youth have examined associations between perceived risks of smoking cigarettes and blunt use (Curry et al., 2023); associations between perceived risks of smoking cigars/marijuana and blunt use (Trapl and Gonzalez, 2018); and perceived risks of blunts vs. other cannabis products (Nguyen et al., 2022; Roditis et al., 2016). However, these studies have often treated blunt use as the outcome variable rather than assessing risk perceptions of blunts as the outcome variable, making it unclear how demographic characteristics are associated with risk perceptions. This information could be important when developing and tailoring interventions to address risk perceptions of blunt use. Moreover, no survey research studies to our knowledge have examined correlates of knowledge that blunts contain nicotine among youth. Accordingly, the goal of this study was to examine how demographic characteristics, cigar use, and blunt use are associated with knowledge and beliefs about blunts among youth in the US.

2. Methods

2.1. Participants

This study was part of a parent study examining the effectiveness of larger, pictorial cigar warning labels on perceived warning effectiveness. At the end of the parent study, we included questions on blunt knowledge and beliefs ("current study"). Participants were a sample of US youth (ages 15–20) recruited from April through June 2023 from Qualtrics, which aggregates panels for survey research studies. A total of $N = 506$ youth comprised the final sample, and the survey took a median of 14 min to complete. Eligible participants included those who reported ever use or past 30-day use of little cigars or cigarillos (LCCs) or were classified as susceptible to using LCCs. The survey assessed ever use and past 30-day LCC use using questions from the Population Assessment of Tobacco and Health (PATH) Study (United States Department of Health and Human Services, National Institutes of Health, National Institute on Drug Abuse, United States Department of Health and Human Services, Food and Drug Administration, Center for Tobacco Products, 2023), assessing use separately for little cigars and cigarillos. If youth reported never using LCCs, the survey assessed susceptibility to LCCs using a validated 4-item susceptibility index (e.g., "If one of your best friends were to offer you a cigarillo or little cigar, would you smoke it?"). If participants answered anything other than "definitely not" (among options of "definitely yes," "probably yes," "probably not," and "definitely not") to any of the 4 susceptibility questions, we classified them as susceptible to using LCCs (Pierce et al., 1996). The survey included quotas for age (~50 % between the ages of 15–17), gender (~50 % males), race (at least 20 % Black/African American), and LCC use status (approximately even distribution for LCC use, past 30 day LCC use, and never use but susceptible) to ensure a balanced sample and in order to conduct subgroup analyses for the parent study. The University of North Carolina at Chapel Hill Institutional Review Board approved study procedures, and we obtained consent/assent from all participants.

2.2. Measures

2.2.1. Blunt use frequency

The survey assessed ever blunt use using one question adapted from the PATH Study: "Sometimes people take tobacco out of a little cigar, cigarillo, or large cigar and replace it or mix it with marijuana. This is sometimes called a 'blunt'. Have you ever smoked part or all of any type of cigar with marijuana in it?" Participants who reported "yes" were then asked one item to assess blunt use frequency adapted from the PATH Study: "When you smoke a cigar, how often do you replace or mix the tobacco with marijuana?" Response options ranged from "every time" (coded as 5) to "never" (coded as 1). We combined responses from these two questions on blunt use to create a 3-level blunt use frequency variable: 1) never blunt use (i.e., reported never smoking blunts or reported ever smoking blunts but "never" for frequency), 2) infrequent blunt use (i.e., reported smoking blunts "rarely" or "sometimes"), or 3) frequent blunt use (i.e., reported smoking blunts "most of the time" or "every time").

2.2.2. Knowledge that blunts contain nicotine

The survey assessed knowledge of blunts containing nicotine by asking: "Do you think blunts contain nicotine?" Response options were "yes," "no," and "not sure." Given that blunts made from cigars expose people to nicotine through the cigar leaf wrapper (Peters et al., 2016) and the survey defined blunts as made from cigars, the correct response to this question was "yes." We developed this item given the lack of previous research on this topic.

2.2.3. Relative addiction/harm perceptions

The survey assessed relative addiction/harm perceptions about blunts with two items: "Compared to a cigar with only tobacco, do you think blunts are…" with 5-point response scales ranging from "much less [addictive/harmful]" (coded as 1) to "much more [addictive/harmful]" (coded as 5). We adapted the question stem and response options from the National Youth Tobacco Survey.

2.2.4. Demographics

We asked demographic questions in the screener and at the end of the survey, including participants' age, race, ethnicity, gender, and sexual orientation. We obtained demographic measures from the PATH Study, the Williams Institute (to assess sexual orientation), and previously used youth surveys from the study team.

2.3. Data analysis

We first descriptively examined 1) the frequencies and overlap between LCC use status and blunt use frequency and 2) knowledge that blunts contain nicotine and relative addiction/harm perceptions by demographic characteristics, LCC use status, and blunt use frequency. We then conducted separate bivariate and multivariable regression

models to examine correlates of knowledge that blunts contain nicotine (logistic regression; modeling "yes" as 1 and "no" or "not sure" as 0), increased relative addiction perceptions (ordinal regression), and increased relative harm perceptions (ordinal regression). Results from the regression models include odds ratios (*ORs*), adjusted odds ratios (*aORs*), and 95 % confidence intervals (CIs). Participants with missing data (n = 33) were dropped from the final regression models. We interpreted estimates as statistically significant if the 95 % CIs did not cross 1. We conducted analyses using SAS version 9.4 (SAS Institute Inc., Cary, NC, USA).

3. Results

3.1. Participant characteristics

The mean age of participants was 17.6 (SD: 1.6), and around half reported being a man/boy (48.6 %) (Table 1). Most youth identified as white (59.3 %), followed by Black/African American (21.9 %). In addition, 26.7 % of youth reported being Hispanic/Latino. In terms of LCC use status, 32 % reported use in the past 30 days, 20.6 % reported ever use of LCCs (but not use in the past 30 days), and 47.4 % were classified as susceptible to using LCCs. For blunt use, 25.5 % frequently used blunts (i.e., "most of the time" or "every time"), 15.8 % infrequently used blunts (i.e., "rarely" or "sometimes"), and 58.5 % never used blunts.

Table 1
Participant characteristics for youth (ages 15–20) from the United States who have used or are susceptible to using LCCs in 2023, N = 506.

Variable	n (%)
Age, *M* (*SD*)	17.6 (1.6)
Race[b]	
White	300 (59.3)
Black or African American	111 (21.9)
American Indian or Alaska Native	26 (5.1)
Asian	35 (6.9)
Native Hawaiian or Pacific Islander	6 (1.2)
Middle Eastern or Northern African	4 (0.8)
Other	55 (10.9)
Missing	12 (2.4)
Hispanic, Latino, or Spanish Origin	
No	356 (70.4)
Yes	135 (26.7)
Don't know	15 (3.0)
Gender	
Man or boy	246 (48.6)
Woman or girl	227 (44.9)
Gender neutral	3 (0.6)
Non-binary	17 (3.4)
Genderqueer	5 (1.0)
None of these describe me	1 (0.2)
Prefer not to answer	7 (1.4)
Sexual orientation	
Gay or lesbian	29 (5.7)
Straight/heterosexual	343 (67.8)
Bisexual	92 (18.2)
Something else	16 (3.2)
I am not sure yet	18 (3.6)
I do not know what this question means	8 (1.6)
LCC use status	
Susceptible to using LCCs	240 (47.4)
Ever use (but not past 30-day use)	104 (20.6)
Past 30-day use	162 (32.0)
Blunt use frequency	
Never	296 (58.5)
Infrequent	80 (15.8)
Frequent	129 (25.5)
Missing	1 (0.20)

Note. LCC = Little cigar and cigarillo.
[a] The exact n varies depending on variable missingness.

3.2. Frequency of blunt use by LCC use status

Frequent blunt use was high among those reporting past 30-day use of LCCs (49.4 %) or ever use of LCCs (34.6 %) (Fig. 1). In contrast, among youth who were susceptible to using LCCs but did not report using LCCs, frequent blunt use was low (5.4 %). Among those reporting frequent blunt use, 62.0 % reported past 30-day LCC use, 27.9 % reported ever LCC use, and 10.1 % reported susceptibility to using LCCs.

3.3. Knowledge that blunts contain nicotine

Descriptive statistics on knowledge and relative addiction and harm perceptions by participant characteristics appear in Table 2, and unadjusted associations appear in Table 3. Around one-third of participants (32.1 %) thought that blunts do not contain nicotine, 25.7 % were not sure, and 42.2 % thought that blunts do contain nicotine.

In adjusted logistic regression models, youth who identified as Black/African American (relative to those who identified as white) had lower odds of correct knowledge that blunts contain nicotine (*aOR* = 0.51, 95 % CI: 0.30, 0.87) (Table 4). Youth who reported ever using LCCs (*aOR* = 1.86, 95 % CI: 1.08, 3.23) had higher odds of correct knowledge that blunts contain nicotine compared with youth who were susceptible to using LCCs but had never used LCCs. No other variables were significantly associated with correct knowledge that blunts contain nicotine. In bivariate models, youth reporting past-30 day LCC use (compared with susceptibility to using LCCs), frequent blunt use (compared with never blunt use), and those who reported their gender as man/boy (relative to woman/girl) had higher odds of correct knowledge that blunts contain nicotine; these associations were not statistically significant in multivariable models, likely due to correlations between LCC use, blunt use, and gender. In particular, youth reporting LCC use tended to report blunt use, and men/boys tended to report LCC and blunt use more than women/girls.

3.4. Relative harm perceptions of blunts

Mean relative addiction and harm perceptions for blunt use among youth were 2.7 and 2.5, respectively, on a scale from 1 to 5 (Table 2). Overall, 45.0 % of youth thought that blunts were "much less" or "slightly less" addictive than cigars with only tobacco, 33.9 % thought that blunts were equally addictive, and 21.2 % thought that blunts were "much more" or "slightly more" addictive. In addition, 51.5 % of participants thought that blunts were "much less" or "slightly less" harmful than cigars with only tobacco, 32.9 % thought that blunts were equally harmful, and 15.6 % thought that blunts were "much more" or "slightly more" harmful.

Youth who frequently used blunts (*aOR* = 0.39; 95 % CI: 0.24, 0.63) or infrequently used blunts (*aOR* = 0.52; 95 % CI: 0.31, 0.87) were less likely to report that blunts were more addictive (vs. unmodified cigars) compared with youth who never used blunts. Similarly, youth who frequently used blunts (*aOR* = 0.31; 95 % CI: 0.19, 0.50) were less likely to report blunts were more harmful (vs. unmodified cigars) compared with youth who never used blunts. In addition, youth who reported their gender identity as woman/girl (*aOR* = 1.51; 95 % CI: 1.05, 2.17) or another response (e.g., non-binary, genderqueer) (*aOR* = 2.23; 95 % CI: 1.01, 4.91) were more likely to report that blunts were more harmful (vs. unmodified cigars) compared with youth who reported that their gender was man/boy. No other variables were significantly associated with relative addiction or harm perceptions. However, in bivariate models,

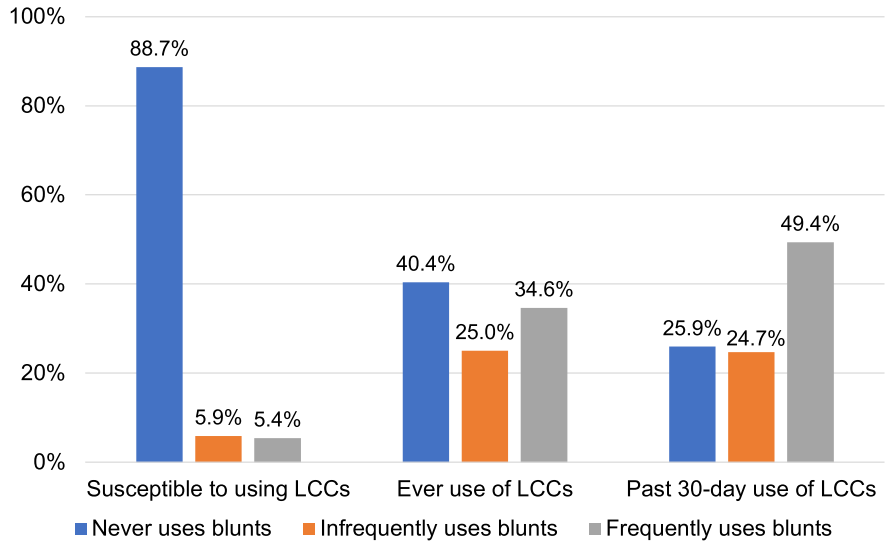

Fig. 1. Blunt use frequency by LCC use status among youth (ages 15–20) from the United States who have used or are susceptible to using LCCs in 2023, $N = 506$. *Note.* LCC = Little cigar and cigarillo.

older youth were less likely to report that blunts were more addictive and harmful (vs. unmodified cigars); these associations were no longer statistically significant in multivariable models, likely due to correlations among age, LCC use, and blunt use. In particular, older individuals reported LCC and blunt use more often.

4. Discussion

Our study with a sample of US youth who had either used or were susceptible to using LCCs found that about 1 in 3 participants did not know that blunts contain nicotine, and around half thought that blunts were less harmful and less addictive than unmodified cigars containing only tobacco. Although youth commonly use blunts (Jensen et al., 2024), little research has examined correlates of blunt-related knowledge and beliefs among youth in the US. Our findings raise concerns that youth do not know that blunts contain nicotine and may underestimate the addictiveness or harmfulness of blunts, which could contribute to experimentation and use.

Around half of youth in our study thought that blunts do not contain nicotine or were unsure. Previous research suggests that youth do associate tobacco products, such as e-cigarettes and cigars, with nicotine (Wiseman et al., 2016; Balzer et al., 2023), and they tend to know that nicotine can be addictive, make one sick in high doses, and alter brain chemistry (Wiseman et al., 2016). Our findings show that these same associations may not extend to blunts. The US Food and Drug Administration (FDA) has proposed that cigar packages carry a warning on nicotine exposure ("This product contains nicotine. Nicotine is an addictive chemical."); however, this warning is not currently mandated in the US. Even if it were mandated, it is unlikely that warning exposure would affect knowledge that blunts can also expose people to nicotine, given the common belief that nicotine is only found in tobacco leaf/filler, not the wrapper (Hackworth et al., 2023). Therefore, our findings suggest that campaigns about the unique risks of blunts, including nicotine exposure, are needed. While campaigns about blunts have not yet been developed, tobacco prevention campaigns have been successful among youth (Allen et al., 2015), which suggests that blunt-specific campaigns could potentially change beliefs and behaviors.

Moreover, Black/African American youth in our study were more likely to hold misperceptions or uncertainty about whether blunts contain nicotine than white youth. Given that some studies have shown higher rates of blunt use among Black/African American adults (Mantey et al., 2021) and youth (Ebrahimi Kalan et al., 2021), further research may be needed to understand why Black/African American youth are less likely to believe that blunts contain nicotine. Importantly, the tobacco industry has long targeted Black/African American communities through advertising, sponsored events, promotions, and discounts for tobacco products. Examples of this disproportionate targeting have also included prominent cigar brands supporting cultural events designed to reach Black/African American young people (Ganz et al., 2018) and popular hip-hop stars promoting blunt use (Richardson et al., 2014). It is possible that unfair tobacco industry marketing practices for Black/African American communities could impact knowledge among Black/African American youth, which could be explored in future research. Interestingly, while we observed that Black/African American youth in our study were less likely to believe that blunts contained nicotine when compared with white youth, there was no statistically significant difference between Black/African American youth and white youth on relative addiction perceptions. This finding could also be explored in future research, including how patterns of and reasons for blunt use among Black/African American youth contribute to knowledge and beliefs about blunts.

Extending previous *qualitative* research on perceptions of blunts (Schauer et al., 2017; Kong et al., 2018; Koopman Gonzalez et al., 2017), around half of youth in our study thought that blunts were less addictive and less harmful than cigars containing only tobacco, which is concerning given that blunts are still combustible products and associated with health risks. Previous *survey* studies with youth have also been conducted on harm perceptions of blunts, focusing on how youth perceive the harms of blunts vs. cannabis (Nguyen et al., 2022; Roditis et al., 2016) or cigarettes (Roditis et al., 2016) and how the perceived harm of cigars (Trapl and Gonzalez, 2018), cannabis (Trapl and Gonzalez, 2018), or cigarettes (Curry et al., 2023) is associated with blunt use. Overall, these studies have found that youth perceive blunts to be less addictive and harmful than cigarettes (Roditis et al., 2016); youth perceive blunts as conferring similar risks to other combustible cannabis products and fewer risks than non-combustible cannabis products (Nguyen et al., 2022); and higher cigar harm perceptions are associated with higher odds of blunt vs. cigar use among youth (Trapl and Gonzalez, 2018). However, these studies did not compare the relative harm of blunts vs. unmodified cigars as we did in our study, so it is difficult to compare our results to previous research. Our study also includes a different population of youth—those who have used LCCs or are

Table 2
Knowledge that blunts contain nicotine and relative addiction/harm perceptions by participant characteristics among youth (ages 15–20) from the United States who have used or are susceptible to using LCCs in 2023, $N = 506$.[a]

	Knowledge that blunts contain nicotine n (%)	Relative addiction perceptions of blunts M (SD)	Relative harm perceptions of blunts M (SD)
Overall	213 (42.2)	2.7 (1.2)	2.5 (1.1)
Race			
White	126 (46.2)	2.6 (1.2)	2.5 (1.1)
Black or African American	25 (27.5)	2.6 (1.2)	2.4 (1.2)
More than one race	17 (46.0)	2.7 (1.0)	2.6 (1.2)
Other race[b]	40 (44.0)	2.9 (1.2)	2.7 (1.1)
Hispanic, Latino, or Spanish Origin			
No	147 (41.4)	2.7 (1.2)	2.5 (1.1)
Yes	63 (46.7)	2.8 (1.1)	2.7 (1.1)
Gender			
Man or boy	117 (47.8)	2.6 (1.1)	2.4 (1.0)
Woman or girl	83 (36.6)	2.8 (1.2)	2.7 (1.2)
Other response[c]	11 (42.3)	2.8 (1.3)	2.7 (0.9)
Sexual Orientation			
Straight/ heterosexual	154 (45.0)	2.7 (1.2)	2.6 (1.1)
LGB	44 (36.4)	2.6 (1.1)	2.5 (1.1)
Other response[d]	15 (35.7)	2.7 (1.3)	2.6 (1.2)
LCC use status			
Susceptible to using LCCs	79 (33.1)	2.9 (1.2)	2.8 (1.1)
Ever use (but not past 30-day use)	52 (50.0)	2.5 (1.2)	2.3 (1.1)
Past 30-day use	82 (50.6)	2.5 (1.1)	2.3 (1.1)
Blunt use frequency			
Never	109 (36.8)	2.9 (1.2)	2.8 (1.1)
Infrequent	36 (45.0)	2.4 (1.0)	2.3 (0.9)
Frequent	68 (52.7)	2.3 (1.2)	2.1 (1.0)

Note. LCC = Little cigar and cigarillo. LGB = Lesbian, gay, or bisexual.
[a] The exact *n* varies depending on variable missingness.
[b] Includes participants who reported their race as American Indian or Alaska Native; Asian; Native Hawaiian or Pacific Islander; Middle Eastern or Northern African; or "other."
[c] Includes participants who reported their gender as gender neutral, Non-binary, Genderqueer, or "none of these describe me."
[d] Includes participants who reported their sexual orientation as "something else," "I am not sure yet," and "I do not know what this question means."

Table 3
Correlates of knowledge that blunts contain nicotine and relative addiction/harm perceptions by participant characteristics using bivariate models among youth (ages 15–20) from the United States who have used or are susceptible to using LCCs in 2023, $N = 506$.[a]

	Knowledge that blunts contain nicotine *OR* (95 % CI)	Relative addiction perceptions of blunts *OR* (95 % CI)	Relative harm perceptions of blunts *OR* (95 % CI)
Age, *M* (*SD*)	1.03 (0.92, 1.14)	0.89 (0.81, 0.98)	0.88 (0.80, 0.97)
Race			
White	Ref.	Ref.	Ref.
Black or African American	0.44 (0.26, 0.74)	1.04 (0.68, 1.60)	0.78 (0.51, 1.20)
More than one race	0.99 (0.50, 1.98)	1.27 (0.69, 2.35)	1.14 (0.61, 2.11)
Other race[b]	0.92 (0.57, 1.48)	1.57 (1.02, 2.41)	1.40 (0.91, 2.15)
Hispanic, Latino, or Spanish Origin			
No	Ref.	Ref.	Ref.
Yes	1.24 (0.83, 1.85)	1.28 (0.89, 1.82)	1.31 (0.92, 1.88)
Gender			
Man or boy	Ref.	Ref.	Ref.
Woman or girl	0.63 (0.44, 0.91)	1.31 (0.94, 1.81)	1.61 (1.16, 2.23)
Other response[c]	0.80 (0.35, 1.82)	1.28 (0.62, 2.65)	1.83 (0.88, 3.80)
Sexual orientation			
Straight/ heterosexual	Ref.	Ref.	Ref.
LGB	0.70 (0.46, 1.07)	0.83 (0.57, 1.20)	0.94 (0.65, 1.37)
Other response[d]	0.68 (0.35, 1.32)	1.04 (0.58, 1.84)	0.99 (0.56, 1.77)
LCC use status			
Susceptible to using LCCs	Ref.	Ref.	Ref.
Ever use (but not past 30-day use)	2.03 (1.27, 3.24)	0.55 (0.36, 0.83)	0.43 (0.28, 0.66)
Past 30-day use	2.08 (1.38, 3.13)	0.55 (0.39, 0.79)	0.44 (0.31, 0.64)
Blunt use frequency			
Never	Ref.	Ref.	Ref.
Infrequent	1.40 (0.85, 2.31)	0.43 (0.28, 0.68)	0.50 (0.32, 0.78)
Frequent	1.91 (1.26, 2.91)	0.38 (0.26, 0.56)	0.28 (0.19, 0.41)

Note. OR = Unadjusted odds ratio; CI = Confidence interval; LCC = Little cigar and cigarillo.
[a] The exact *n* varies depending on variable missingness.
[b] Includes participants who reported their race as American Indian or Alaska Native; Asian; Native Hawaiian or Pacific Islander; Middle Eastern or Northern African; or "other."
[c] Includes participants who reported their gender as gender neutral, Non-binary, Genderqueer, or "none of these describe me."
[d] Includes participants who reported their sexual orientation as "something else," "I am not sure yet," and "I do not know what this question means."

susceptible to using LCCs. While our study did not assess *absolute* risk/harm perceptions, which is needed in future research, our findings generate concern that youth may underestimate the harms associated with blunts. For instance, youth who reported frequently using blunts perceived blunts as less addictive and less harmful than those not using blunts. This finding aligns with other research showing that those who use a tobacco or cannabis product view it as less risky than those who do not use the product (Harrison et al., 2023; Russell et al., 2020). Campaigns and public health messages/education on potential health risks may be needed to reduce youth blunt use, perhaps targeting messages to youth with lower addiction/harm perceptions of blunts and higher frequency use (e.g., men/boys, older youth).

Developing new campaigns about the health effects of blunts will benefit from new research on blunt-specific health effects and a better understanding of the wide variety of products that can be used to make blunts. While much is known about the general risks of cannabis use (National Academies of Sciences, Engineering, and Medicine, 2017), Schauer et al.'s systematic review of co-administered tobacco and marijuana products did not find any studies on the long-term health consequences of blunt use (Schauer et al., 2017). Moreover, the risks of blunt use may depend on how blunts are made. For instance, while research shows that blunts made from cigars contain nicotine (Peters et al., 2016), blunts made from tobacco-free blunt wraps (e.g., hemp paper) would not typically be associated with nicotine exposure. A recent study of high school students in Connecticut found that tobacco-free blunt wraps were the most popular method for making blunts (Morean et al., 2023); however, many adolescents may not know what they are using to make blunts, given that blunts are most commonly used in social settings (Kong et al., 2018; Antognoli et al., 2018), and products

Table 4
Correlates of knowledge that blunts contain nicotine and relative addiction/harm perceptions by participant characteristics using multivariable models among youth (ages 15–20) from the United States who have used or are susceptible to using LCCs in 2023, $N = 473$.

	Knowledge that blunts contain nicotine *aOR* (95 % CI)	Relative addiction perceptions of blunts *aOR* (95 % CI)	Relative harm perceptions of blunts *aOR* (95 % CI)
Age, *M* (*SD*)	0.94 (0.83, 1.06)	0.95 (0.85, 1.06)	0.98 (0.88, 1.09)
Race[a]			
White	Ref.	Ref.	Ref.
Black or African American	0.51 (0.30, 0.87)	0.95 (0.61, 1.49)	0.68 (0.43, 1.07)
More than one race	1.00 (0.47, 2.12)	1.38 (0.71, 2.68)	1.16 (0.60, 2.27)
Other race[a]	0.94 (0.55, 1.61)	1.32 (0.83, 2.12)	1.04 (0.65, 1.67)
Hispanic, Latino, or Spanish Origin			
No	Ref.	Ref.	Ref.
Yes	1.31 (0.83, 2.08)	0.98 (0.66, 1.47)	1.02 (0.68, 1.53)
Gender			
Man or boy	Ref.	Ref.	Ref.
Woman or girl	0.73 (0.48, 1.10)	1.17 (0.82, 1.67)	1.51 (1.05, 2.17)
Other response[b]	0.84 (0.34, 2.07)	1.44 (0.66, 3.14)	2.23 (1.01, 4.91)
Sexual orientation			
Straight/ heterosexual	Ref.	Ref.	Ref.
LGB	0.81 (0.50, 1.32)	0.80 (0.53, 1.21)	0.83 (0.55, 1.26)
Other response[c]	0.71 (0.32, 1.56)	0.65 (0.34, 1.27)	0.54 (0.27, 1.05)
LCC use status			
Susceptible to using LCCs	Ref.	Ref.	Ref.
Ever use (but not past 30-day use)	1.86 (1.08, 3.23)	0.79 (0.49, 1.27)	0.67 (0.41, 1.08)
Past 30-day use	1.61 (0.93, 2.79)	0.97 (0.60, 1.56)	0.80 (0.49, 1.29)
Blunt use frequency			
Never	Ref.	Ref.	Ref.
Infrequent	1.10 (0.61, 1.97)	0.52 (0.31, 0.87)	0.62 (0.37, 1.04)
Frequent	1.45 (0.85, 2.47)	0.39 (0.24, 0.63)	0.31 (0.19, 0.50)

Note. a*OR* = Adjusted odds ratio; CI = Confidence interval; LCC = Little cigar and cigarillo.

[a] Includes participants who reported their race as American Indian or Alaska Native; Asian; Native Hawaiian or Pacific Islander; Middle Eastern or Northern African; or "other."

[b] Includes participants who reported their gender as gender neutral, Non binary, Genderqueer, or "none of these describe me."

[c] Includes participants who reported their sexual orientation as "something else," "I am not sure yet," and "I do not know what this question means."

used to make blunts may not be purchased directly by youth. Our definition of a blunt was based on the PATH Study, which specifies blunts made from little cigars, cigarillos, or large cigars. Therefore, the correct answer to the question of whether blunts contain nicotine in our study was "yes." Future research is needed on whether knowledge about blunts containing nicotine differs according to how blunts are made (e.g., by modifying cigars or via blunt wraps).

Finally, our study found interesting patterns of LCC use and frequency of blunt use. First, among youth reporting past 30-day LCC use, we found that around half reported frequently using blunts, which suggests that researchers focusing on youth cigar use should 1) recognize that many youth may use LCCs as blunts and 2) investigate the impact of cigar policies and interventions on blunt use. Second, among youth reporting frequent use of blunts, we found that around 40 % did not report past 30-day LCC use. This finding points to the need to assess blunt use universally rather than just among those reporting cigar use, since some youth who smoke blunts may not consider themselves to be "cigar smokers." (Delnevo et al., 2011) Indeed, in a recent nationally representative survey, the vast majority of youth (72.5 %) reported exclusive blunt use (with no use of cigars) as the most prevalent cigar use pattern (Jensen et al., 2024).

4.1. Limitations

This study had several limitations, including that we used non-probability sampling and limited our inclusion criteria to those reporting LCC use or susceptibility, which limits generalizability to other youth populations, including youth who exclusively use blunts without reporting use of or susceptibility to LCCs. However, our sample still included many participants who used or were familiar with blunts, making it an appropriate sample to answer our research questions. In addition, since this was a one-time survey, we also cannot examine either how knowledge and beliefs about blunts are associated with behavioral outcomes or the directionality of these associations. Finally, we only measured *relative* addiction/harm perceptions of blunts, not absolute addiction/harm perceptions.

5. Conclusions

Our study with a sample of US youth—who have used cigars or are susceptible to using cigars—found that about 1 in 3 participants did not know that blunts contain nicotine, and around half thought that blunts were less harmful and less addictive than unmodified cigars containing only tobacco. Future research could focus on assessing absolute addiction and harm perceptions of blunts, examining how cigar brand is associated with patterns of blunt use and risk perceptions, developing and testing messages about the risks of blunt use, and examining how beliefs and behaviors about blunts differ according to how blunts are made, reasons for use, and contexts of use.

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Sarah D. Kowitt: . **Michael Jetsupphasuk:** Writing – review & editing, Validation. **Sonia A. Clark:** Writing – review & editing, Methodology, Investigation, Conceptualization. **Kristen L. Jarman:** Writing – review & editing, Project administration, Methodology, Investigation, Conceptualization. **Adam O. Goldstein:** Writing – review & editing. **James F. Thrasher:** Writing – review & editing. **Rime Jebai:** Writing – review & editing. **Leah M. Ranney:** Writing – review & editing, Methodology, Investigation, Funding acquisition, Conceptualization. **Jennifer Cornacchione Ross:** Writing – review & editing, Methodology, Investigation, Funding acquisition, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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