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Co-Use of Tobacco and Marijuana Among Young People Experiencing Homelessness in Los Angeles County

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Abstract

Introduction.—Tobacco and marijuana co-use among young people in the U.S. is a public health concern that deserves greater attention. This study addresses a significant gap in the literature by examining the prevalence and correlates of tobacco and marijuana co-use among young people experiencing homelessness.

Methods.—The analytic sample consisted of 449 unaccompanied homeless youth (mean age=22; 72% male) who had used any type of tobacco product in the past 30 days. Participants were recruited from 12 service sites and 13 street sites in Los Angeles County.

Results.—Over 90% of young homeless tobacco users reported past month marijuana and tobacco co-use: 65% reported any co-administration (mixing both substances in a cigarette, joint, blunt, bong, hookah, pipe or bowl) and 27% reported only using them separately. Analysis of covariance tests found that co-administrators reported greater quantity and frequency of tobacco cigarette use, more frequent marijuana use, and, in some cases, poorer functioning and more severe homelessness compared to other tobacco users ($p<.05$). Logistic regression analysis indicated that co-administration was less likely among youth who were Black (vs. white) and who perceived it as being the same or more harmful than cigarette smoking, but more likely among youth who reported greater exposure to peers who engaged in co-administration ($p<.05$).

Conclusions.—Co-administration of tobacco and marijuana is prevalent among young tobacco users experiencing homelessness. Results add to a growing literature on the prevalence and potential risks of co-administration among young people that can inform policies aimed at regulating tobacco and marijuana products.

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Keywords

tobacco; marijuana; cannabis; co-use; homeless; youth

1. INTRODUCTION

Given the increasing legalization of marijuana for recreational use in the U.S., there is public health concern about its co-use with other substances, particularly tobacco. Rates of tobacco and marijuana co-use among adults age 18 and older increased by 18.2% from 2003 to 2012, with 18–25 year olds consistently reporting the highest rates of co-use (Schauer et al. 2015). A recent study of young adults in California found that among past year tobacco users, 36% had used both tobacco and marijuana, but only on separate occasions, and 46% had used both substances together in some way (e.g., one right after the other, mixing them together) during the past year (Tucker, Pedersen et al., 2019). There is a growing literature indicating that young people who co-use tobacco and marijuana tend to be heavier users and have poorer functioning compared to single-product users (Georgiades & Boyle, 2007; Hernández-Serrano et al., 2018; Moore & Budney, 2001; Suris et al., 2007). However, much less attention has focused on potentially important differences between types of tobacco and marijuana co-users (e.g., those who only use the two products separately versus mix them in the same delivery device), as well as the prevalence and potential risks associated with co-use in vulnerable populations.

In particular, young people experiencing homelessness have been overlooked in the literature on tobacco and marijuana co-use. This is an important gap given that this population has high rates of both tobacco and marijuana use (Santa Maria et al., 2018; Wenzel et al., 2010), and thus greater potential for co-use. For example, a recent study found that 81% of young people experiencing homelessness who rolled their own cigarettes reported filling them with a mixture of tobacco and marijuana on at least some occasions (Tucker, Shadel et al., 2019). The co-use of tobacco and marijuana, which has been associated with elevated health risks compared to use of either substance alone (Meier & Hatsukami, 2016), may have a particularly adverse impact in this young population given the considerable physical and psychosocial challenges that they already face related to their homelessness (Edidin et al., 2012). The present study is a first step in understanding the prevalence, types, and correlates of co-use in a probability sample of young tobacco users experiencing homelessness.

2. METHODS**2.1. Participants and Procedures**

Participants are from a larger study of 469 individuals in Los Angeles County who: (a) were between the ages of 13–25; (b) were not currently living with a parent or guardian; (c) were not getting most of their support for food and housing from family or a guardian; (d) spent the previous night in a shelter, outdoor or public place, hotel or motel room rented with friends (because of no place else to go), or other place not intended as a domicile; and e) had used any type of cigarette, e-cigarette, or other tobacco product or electronic nicotine delivery system in the past 30 days (note that only 6% of individuals were ineligible solely

for this reason). The sample was 21.8 years old ($SD=2.3$), on average, and racially/ethnically diverse (weighted percentages: 29% non-Hispanic white, 23% Hispanic, 33% black, and 15% multi-ethnic/other). Participants were compensated \$20 for completing a self-administered survey. This research was approved by RAND's institutional review board.

The process of recruiting this probability sample from 12 service sites and 13 street venues in Los Angeles County is described in more detail elsewhere (Tucker, Shadel et al., 2019). Briefly, we adopted a multi-stage design with the first stage involving the selection of sites. All selected sites were investigated multiple times and at various times of day to obtain an estimate of the average number of young people served daily by the service sites and the average number that “hang out” at the street venues in a given day. Information collected through site investigations was used to assign a quota for the number of completed interviews to be achieved at each site which was approximately proportional to the size of a site. The second stage of the sampling design consisted of drawing a probability sample of homeless young people from the 25 study sites. A total of 613 individuals were initially approached for eligibility screening and 370 screened eligible (of which 8 refused the survey, 5 did not complete the survey once started, and 357 completed the survey). Three of the 357 completers were subsequently dropped from the dataset due to significant discrepancies in reported tobacco use across items. Near the end of this initial data collection, we conducted supplemental data collection in order to increase the number of lesbian, gay, bisexual, transgender, or questioning (LGBTQ) individuals in our sample. We focused our supplemental efforts on 10 of the original 25 sites where at least 25% of the initial survey participants had self-identified as LGBTQ. Young people who identified as LGBTQ, and met all other eligibility criteria, were invited to participate. A total of 420 individuals were approached for eligibility screening and 121 screened eligible (of which 4 refused the survey, 2 did not complete the survey once started, and 115 completed the survey).

2.3 Study Variables

2.3.1. Demographics.—These included age, gender (female and transgender female, male and transgender male), sexual orientation (straight/heterosexual vs. lesbian, gay, bisexual, questioning or asexual), and race/ethnicity [white (reference) vs. Hispanic, black, and multiracial/other)].

2.3.2. Tobacco and marijuana use.—Five items assessed participants' past 30 day use of tobacco (cigarettes; natural cigarettes; cigars; little cigars or cigarillos; hookah/waterpipe to smoke tobacco) and two items assessed their past 30 day use of marijuana [marijuana (pot, weed, grass, hash, bud); e-cigarette, “vape pen” or vaporizer filled with a marijuana product (hash oil, THC wax, or dried buds)]. Co-administration in the past 30 days was assessed with a single item and defined as “tobacco mixed with marijuana (e.g., mixing tobacco and marijuana in a cigarette, joint, blunt, bong, hookah, pipe or bowl).” In all cases, response options ranged from 0=*0 days* to 6=*all 30 days*. Based on the frequency of use information, we created three mutually-exclusive groups: tobacco use only (endorsed at least one tobacco item, but did not report marijuana use); co-use, but no co-administration (endorsed at least one tobacco and one marijuana item, but did not report any co-

administration); and co-administration (endorsed at least one tobacco and one marijuana item, and reported engaging in co-administration). The analytic sample consists of $N=449$, dropping 1 individual who did not endorse any of the tobacco or marijuana items listed above and 19 individuals who endorsed the co-administration item without also endorsing at least one of the tobacco items and one of the marijuana items listed above.

Analyses also included information on the number of cigarettes smoked on the days they smoked (nonsmokers were coded as 0) and quitting motivation for cigarettes. The latter was assessed with a modified contemplation ladder (Biener & Abrams, 1991; Niaura & Shadel, 2003), with participants classified as seriously thinking about quitting cigarettes within the next 30 days (=1) versus not (=0).

2.3.3. Mental and physical health.—Mental health was assessed with the eight-item Patient Health Questionnaire (PHQ-8; Kroenke et al., 2009) for symptoms of depression in the past 2 weeks (0=*not at all* to 3=*nearly every day*), with scores of 10 or higher indicating a positive screen for depression. Physical health was assessed with a widely used single-item indicator of subjective overall health (1=*very poor* to 5=*excellent*).

2.3.4. Homelessness severity.—Sleeping outdoors in the past 30 days because of nowhere else to stay (0=*no*, 1=*yes*) and length of the most recent period of homelessness were used as indicators of homelessness severity.

2.3.5. Co-use perceptions and social influences.—Perceptions of using tobacco mixed with marijuana, relative to using cigarettes, was assessed in terms of perceived cost [less expensive, as expensive (reference), or more expensive; based on Shadel et al., in press] and perceived harm [less harmful, as harmful (reference), or more harmful; Smith et al., 2007]. Participants also rated the general riskiness to someone's health of using tobacco mixed with marijuana (0=*not at all risky* to 3=*very risky*). We assessed social exposure to co-administration with the following item (0=*never* to 3=*often*): "How often are you around or with people who use tobacco mixed with marijuana?"

2.4. Analyses

Analysis of covariance tests and follow-up Tukey post hoc tests were conducted to compare the three mutually exclusive groups: tobacco use only; co-use, but no co-administration; or co-administration. These group comparisons controlled for demographic covariates described above. Logistic regression analysis was used to examine bivariate associations of any co-administration with demographic characteristics, co-use perceptions and social influences. Departures from proportionate-to-size random sampling due to changes in the sampling rates during the fielding period, differential non-response rates across sites, and differential rates of visits to service sites and street venues among homeless young people require the use of weights to adjust estimates and correct for potential bias due to participants' differential inclusion probabilities. All analyses incorporate these weights and account for the modest design effect that they induce.

3. RESULTS

Co-use of tobacco with marijuana was common in our sample of past month tobacco users, with only 9% of participants reporting exclusive use of tobacco. About one-quarter (27%) of participants reported using tobacco and marijuana in the past month, but never mixing them in a cigarette, joint, blunt, bong, hookah, pipe or bowl. The remaining two-thirds (65%) of participants reported co-administration of tobacco and marijuana by mixing them within the same delivery device.

As shown in Table 1, comparison of these three groups indicated that co-administrators reported higher frequency and quantity of cigarette use, as well as higher frequency of marijuana use, compared to other co-users. Co-administrators were also more likely than tobacco only users and other co-users to have probable depression and to have slept outdoors in the past 30 days because of nowhere else to stay. The three groups did not differ, however, in terms of their interest in quitting cigarettes, physical health, or length of most recent period of homelessness.

When examining the correlates of co-administration, Black tobacco users were less likely than their white counterparts to report mixing tobacco with marijuana (see Table 2). Co-administration was also less likely among participants who perceived it to be similarly or more harmful than cigarette smoking, but more likely among those who reported greater exposure to peers who mixed tobacco and marijuana. However, co-administration was not significantly associated with other demographic characteristics, the perceived expense of co-administration relative to cigarette smoking, general perceptions of co-administration's harmful effects on health.

4. DISCUSSION

Results from this study indicate that about 90% of young tobacco users experiencing homelessness engage in tobacco and marijuana co-use. Further, most of these co-users engage in co-administration of these two products within the same delivery device. The extremely high rate of co-administration is concerning given their heavier cigarette and marijuana use compared to other types of co-users, similar to what has been found in general population samples (Tucker, Pedersen et al., 2019). Further, our results suggest that these co-administrators have poorer functioning (i.e., probable depression) and more severe homelessness (i.e., sleeping outdoors) compared to other young tobacco users experiencing homelessness. To reduce co-administration in this population, our results suggest it may be important to target both exposure to peers who engage in co-administration and perceptions of co-administration as being less harmful than cigarette smoking.

Limitations of this study include the small number of tobacco only users, which limited power to detect group differences. It is also a limitation that we did not consider the use of e-cigarettes and personal vaporizers in our definition of co-administration, nor did we compare groups on their use of and interest in quitting tobacco products other than cigarettes. Finally, it is important to note that results from this California sample may not generalize to other parts of the country where marijuana has not been legalized for recreational use.

Nonetheless, results add to a growing literature on the risks associated with tobacco and marijuana co-administration among young people that can inform policies aimed at the regulation of these products.

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HIGHLIGHTS

- Most young tobacco users experiencing homelessness also use marijuana
- Co-administration is more common than using the products separately or tobacco only
- Co-administrators report more cigarette and marijuana use and poorer functioning
- Co-administration is associated with exposure to peers who engage in this behavior
- Correlates also include perceived health risk (but not cost) vis-à-vis cigarettes

Table 1.

Comparing three groups of tobacco users on cigarette and marijuana use, mental and physical health, and homelessness severity

	Group 1	Group 2	Group 3		
	Tobacco use only	Co-use, but no co-administration	Co-administration	Overall ANCOVA	Group differences ^a
	Mean (SE)	Mean (SE)	Mean (SE)	<i>F</i> (<i>df</i>)	-
Frequency of cigarette use, past month	4.93 (0.32)	4.94 (0.19)	5.44 (0.13)	5.20 (8) [‡]	2,3
Quantity of cigarette use, past month	7.22 (2.20)	8.78 (1.27)	12.45 (0.90)	2.21 (8) *	2,3
Thinking about quitting cigarettes, next 30 days	0.23 (0.08)	0.37 (0.04)	0.28 (0.03)	1.95 (8)	
Frequency of marijuana use, past month	n/a	5.13 (0.17)	5.81 (0.12)	2.92 (7) *	2,3
Probable depression	0.16 (0.07)	0.28 (0.04)	0.39 (0.03)	4.03 (8) [‡]	1,3
Subjective physical health	3.24 (0.8)	3.26 (0.10)	3.16 (0.07)	4.46 (8) [‡]	
Slept outdoors, past month	0.49 (0.07)	0.65 (0.04)	0.80 (0.03)	6.00 (8) [‡]	1,3; 2,3
Months most recent homelessness	16.35 (3.63)	14.05 (2.11)	15.95 (1.50)	1.72 (8)	
<i>N</i>	37	104	308		

Note.

^a Group differences significant at $p < .05$.

Adjusted means and SEs after controlling for age, gender, race/ethnicity, and sexual orientation are shown.

* $p < .05$.

[‡] $p < .001$.

Table 2.

Correlates of past month co-administration of tobacco mixed with marijuana

Variable			Any Co-Administration			
		No.	%	OR	(95% CI)	
Age						
	13–20	106	27.1	1.47	0.94	2.31
	21–25 (ref)	343	72.9			
Gender						
	Male/transgender male (ref)	313	71.7			
	Female/transgender female	136	28.3	0.74	0.49	1.14
Sexual orientation						
	Straight/heterosexual (ref)	242	71.1			
	LGBQA	207	28.9	0.67	0.44	1.02
Race						
	White (ref)	139	29.1			
	Hispanic	97	23.6	0.63	0.36	1.09
	Black non-Hispanic	145	32.2	0.51	0.31	0.84
	Multi/other non-Hispanic	68	15.1	1.06	0.55	2.05
Relative expense of co-administration vs. cigarettes						
	Less expensive (ref)	96	19.2			
	As expensive	157	35.6	0.88	0.51	1.52
	More expensive	196	45.1	0.91	0.54	1.55
Relative harm of co-administration vs. cigarettes						
	Less harmful (ref)	227	50.1			
	As harmful	165	33.9	0.47	0.30	0.72
	More harmful	57	16.1	0.32	0.19	0.56
General riskiness of co-administration						
	Not at all risky (ref)	68	15.8			
	A little risky	124	26.2	1.51	0.80	2.86
	Somewhat risky	106	26.5	0.92	0.50	1.71
	Very risky	151	31.4	0.78	0.43	1.40
How often around people who co-administer						
	Never (ref)	62	14.5			
	Hardly ever	49	12.7	3.18	1.43	7.06
	Sometimes	96	24.6	9.83	4.73	20.44
	Often	242	48.2	15.67	7.86	31.22