

# The relationship between past-month marijuana, cigarette, and cigar use among older adults in the United States

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## ABSTRACT

**INTRODUCTION** Previous research indicates that marijuana use may be interrelated with combustible tobacco use among U.S. adolescents and young adults. However, little is known about this relationship during older adulthood. The purpose of this study was: 1) examine the prevalence of past-month marijuana, cigarette and cigar use, and 2) assess the associations between demographic and tobacco-use variables with past-month marijuana use, among a nationally representative sample of U.S. adults 50 years and older.

**METHODS** Data are from the public-use files of the 2013 National Survey on Drug Use and Health (NSDUH). The sample consisted of 6325 adults aged  $\geq 50$  years.

**RESULTS** Overall, 2.98% (N=216) of the sample reported past-month marijuana use; higher prevalence was noted for those who were past-month users of cigarettes (15.62%, N=1162) and lower prevalence was noted for those who were past-month users of cigars (2.68%, N=176). After accounting for covariables, past-month cigarette use was the strongest predictor of past-month marijuana use (adjusted odds ratio [AOR]=5.19, 95% CI, 3.51-7.66). Additionally, past-month cigar use showed a positive association with past-month marijuana use (AOR=2.41, 95% CI, 1.23-4.72).

**CONCLUSIONS** Tobacco prevention, cessation, and control efforts that target older adults should be tailored effectively to address the use of marijuana and other combustible tobacco products.

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## KEYWORDS

marijuana, combustible tobacco, aging, smoking cessation

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## INTRODUCTION

Marijuana is the most commonly used, federally illicit substance, in the United States<sup>1</sup>. In recent years, the prevalence of past-month marijuana use has decreased among adolescents aged 12-17 years and has increased among adults aged 18 years and older<sup>1</sup>. Particularly, the National Survey on Drug Use and Health (NSDUH) showed that from 2002 to 2012, past-month marijuana use increased from 1.2% to 3.0% among adults 50 years and older<sup>1</sup>. This

is important, given that just over 34% of the U.S. population is in this age group, which is projected to increase about 20% by 2030, to 132 million<sup>2</sup>.

Previous research has demonstrated an increased likelihood of marijuana use among current cigarette smokers, yet, most of this work has focused heavily on youth and young adults<sup>3-5</sup>. During late adulthood, combustible tobacco use, namely cigarette smoking, is the leading cause of premature death<sup>6,7</sup>. As with cigarette consumption, cigar smoking has been

shown to be associated with heart disease, cancers and respiratory conditions<sup>6,7</sup>. Research suggests that marijuana use among cigarette and cigar users could undermine smoking cessation efforts<sup>8</sup>. Given the severity of health conditions associated with combustible tobacco use during late adulthood, investigating the relationship between marijuana, cigarettes and cigars may provide insight into ways to: reduce exposure to the harmful effects of tobacco use, enhance smoking cessation interventions by addressing marijuana use and understanding its effects.

The increasing number of past-month marijuana users 50 years and older, coupled with projected growth in the proportion of adults in this age group, warrants better understanding of marijuana and combustible tobacco use. Thus, this short report offers an important step toward understanding the relationship between marijuana, cigarette and cigar use among older adults. In this report, we examine the prevalence of past-month marijuana, cigarette and cigar use, and assess the associations between demographic and combustible tobacco-use variables with past-month marijuana use, among a nationally representative sample of adults 50 years and older.

## METHODS

Data came from the 2013 National Survey on Drug Use and Health (NSDUH), an annual survey that provides population estimates of substance use and health-related behaviors of individuals aged  $\geq 12$  years. A detailed description of the survey is provided elsewhere<sup>1</sup>. Institutional Review Board approval was not needed for this study because NSDUH is publicly available and the data set was not identifiable.

Analyses were restricted to the 6325 respondents aged  $\geq 50$  years. Demographic characteristics examined were: respondents' gender, race/ethnicity, education, employment status, marital status, military service, annual income, and geography. Substance use variables of interest included past-month use of marijuana, cigarettes and cigars. During interviews, all substances were defined or described for respondents. For marijuana use, respondents were asked: 'How long has it been since you last used marijuana or hashish?'. Respondents who selected: 'Within the past 30-days' were categorized as past-month marijuana users. For cigarette and cigar use, participants were asked: 'During

the past 30-days, or since [DATEFILL], on how many days did you smoke part or all of a [cigarette, cigar]?'. Cigars were described as any kind of cigars, 'including big cigars, cigarillos, and even little cigars that look like cigarettes'. Based on their responses, cigarette and cigar use were dichotomized into past-month use and no past-month use.

Data were analyzed using SAS Version 9.4<sup>9</sup>. Prevalence estimates were assessed, in addition to crude and adjusted logistic regression models of past-month marijuana use among respondents  $\geq 50$  years, controlling for demographic characteristics. Variables that were significant and stable in the crude model were included in the final fully adjusted model. Sampling weights were applied to account for the complex survey design.

## RESULTS

Table 1 summarizes past-month use of marijuana, cigarettes and cigars, by demographic characteristics. Overall, the prevalence of past-month cigarette use (15.62%, N=1162) was higher than those of past-month marijuana (2.98%, N=216) and cigar (2.68%, N=176) use. Male respondents were the primary past-month users of cigars (87.23%), marijuana (59.74%), and cigarettes (50.52%). Among males, 16.91% reported past-month cigarette use, followed by cigars (5.01%) and marijuana (3.81%). Among female respondents, 14.50% reported past-month cigarette use, followed by marijuana (2.25%) and cigar (0.26%) use. Non-Hispanic Whites were the primary past-month users of cigars (76.57%), marijuana (74.44%) and cigarettes (73.31%). Among non-Hispanic Whites, 15.44% reported past-month cigarette use, followed by marijuana (2.99%) and cigars (2.77%). Among non-Hispanic Blacks, 21.69% reported past-month cigarette use, followed by cigars (3.16%) and marijuana (2.87%).

Table 2 shows the crude and adjusted odds ratio for past-month marijuana use. Adjusted analyses controlled for demographics. Bivariate analyses showed that past-month use of cigarettes, cigars, identifying as male and being unmarried, were positively associated with past-month marijuana use. After accounting for covariables, past-month cigarette use was the strongest predictor of past-month marijuana use (AOR = 5.19, 95% CI, 3.51-7.66). Past-month cigar use showed a positive

Table 1. Past-month use of marijuana, cigarettes, and cigars, by gender and race/ethnicity, among adults aged ≥50 years (N=6325)

	Marijuana N=216 (2.98%)*		Cigarettes N=1162 (15.62%)*		Cigars N=176 (2.68%)*	
	N=216 (2.98%)*	Row % (95% CI)	Col % (95% CI)	Row % (95% CI)	Row % (95% CI)	Row % (95% CI)
<b>Female</b>	40.26	2.25	49.48	14.50	14.50	0.64
N=3510	(31.83-48.69)	(1.55-2.95)	(45.32-53.64)	(12.96-16.04)	(12.96-16.04)	(0.28-1.01)
<b>Male</b>	59.74	3.81	50.52	16.91	16.91	5.01
N=2815	(51.31-68.17)	(3.00-4.62)	(46.36-54.68)	(14.92-18.89)	(14.92-18.89)	(3.97-6.05)
<b>NH Black</b>	10.06	2.87	14.49	21.69	21.69	3.16
N=677	(4.44-15.67)	(1.28-4.45)	(11.59-17.38)	(17.90-25.48)	(17.90-25.48)	(1.80-4.53)
<b>NH Other</b>	8.84	4.53	3.68	9.89	9.89	1.52
N=395	(2.14-15.53)	(0.77-8.28)	(2.01-5.35)	(5.14-14.64)	(5.14-14.64)	(0.00-3.04)
<b>Hispanic</b>	6.67	2.07	8.53	13.92	13.92	2.20
N=579	(1.13-12.21)	(0.28-3.87)	(5.98-11.07)	(9.50-18.35)	(9.50-18.35)	(0.46-3.94)
<b>NH White</b>	74.44	2.99	73.31	15.44	15.44	2.77
N=4674	(65.58-83.30)	(2.37-3.60)	(69.30-77.32)	(14.26-16.62)	(14.26-16.62)	(2.15-3.39)

\*Unweighted N, weighted %

Note: Col % represents the distribution of the demographic characteristics among users of that substance (e.g. among past-month marijuana users 59.74% were male). Row % represents the prevalence of substance use among that demographic characteristic (e.g. among males 3.81% used marijuana in the past month).

Table 2. Crude and adjusted odds ratios of past-month marijuana use among U.S. adults aged ≥50 years

Demographics	N (%)*	N (%)*	OR	95% CI	AOR**	95% CI
	Only adults aged ≥50 years reporting past month marijuana use	All adults aged ≥50 years				
<b>Gender</b>						
Female	85	3510	0.58	0.40-0.83	0.64	0.45-0.92
Male (ref)	131	2815	-	-	-	-
<b>Education</b>						
Less than HS	5	382	0.71	0.23-2.18	NS	NS
Some HS	31	569	1.50	0.84-2.69	NS	NS
HS grad	82	2069	1.32	0.81-2.15	NS	NS
Some college or more (ref)	98	3305	-	-	NS	NS
<b>Race/ethnicity</b>						
NH Black	30	677	0.96	0.53-1.75	NS	NS
NH Other	23	395	1.54	0.63-3.76	NS	NS
Hispanic	10	579	0.69	0.28-1.70	NS	NS
NH White (ref)	153	4674	-	-	NS	NS
<b>Employment status</b>						
Employed	113	3166	1.50	0.99-2.27	NS	NS
Not employed (ref)	103	3159	-	-	NS	NS
<b>Marital status</b>						
Married	105	3735	0.65	0.43-0.97	0.79	0.51-1.21
Not married (ref)	111	2590	-	-	-	-

Continued

Table 2. Continued

Demographics	N (%) <sup>*</sup> Only adults aged ≥50 years reporting past month marijuana use	N (%) <sup>*</sup> All adults aged ≥50 years	OR	95% CI	AOR <sup>**</sup>	95% CI
<b>Military service</b>						
Yes	37	1023	0.88	0.58-1.36	NS	NS
No (ref)	178	5297	-	-	NS	NS
<b>Income</b>						
\$50 000-\$74 999	24	1094	0.41	0.23-0.76	0.54	0.29-1.02
\$75 000 or more	59	1868	0.77	0.47-1.26	1.16	0.64-2.12
Less than \$50 000 (ref)	133	3363	-	-	-	-
<b>Geography</b>						
Small metro	79	2094	1.58	1.00-2.49	NS	NS
Non-metro	54	1610	1.71	0.97-3.01	NS	NS
Large metro (ref)	83	2621	-	-	NS	NS
<b>Tobacco use</b>						
Past month cigarette use						
Yes	107	1162	5.81	4.03-8.38	5.19	3.51-7.66
No (ref)	109	5163	-	-	-	-
Past month cigar use						
Yes	22	176	4.91	2.64-9.16	2.41	1.23-4.72
No (ref)	194	6149	-	-	-	-

NSDUH - National Survey on Drug Use and Health; OR - Odds Ratio; CI - Confidence Interval; AOR - Adjusted Odds Ratio

<sup>\*</sup>Unweighted N, weighted % <sup>\*\*</sup>adjusted for variables significant in crude model (use of cigarettes, cigars, identifying as male and being unmarried)

association with past-month marijuana use (AOR = 2.41, 95% CI, 1.23-4.72).

## DISCUSSION

Despite the growing number of past-month marijuana users among older adults, few studies have explored the association of marijuana and combustible tobacco use among this population. The present study used data from a national probability sample survey of non-institutionalized U.S. civilian adults 50 years and older, to examine the prevalence of past-month marijuana, cigarette, and cigar use, and to assess the associations between demographic and tobacco-use variables with past-month use of marijuana. We found that nearly 3% of our sample reported past-month use of marijuana, 15.6% cigarettes and 2.6% cigars. Among our sample, the prevalence of past-month cigarette and cigar use is higher than the 2020 target of *Healthy People*<sup>10</sup> for reducing cigarette and cigar use among adults 18 years

and older (12.0% cigarette smoking, 0.2% cigar smoking). Additionally, among our sample, the prevalence of past-month cigarette use (15.6%) is three times higher than past-month cigarette use (5.6%) among adolescents aged 12-17 years reported from the 2013 NSDUH<sup>1</sup>. This is disconcerting, as older adult smokers of combustible tobacco with chronic medical conditions are considered at high-risk for poor health outcomes, due to both the chronic medical conditions and the adverse outcomes associated with smoking<sup>6,7</sup>.

Another important finding of this study is that among past-month users of marijuana, cigarette, cigar and blunt, male respondents outnumbered female respondents. This finding is similar to that of previous studies using data from a national probability sample survey of non-institutionalized U.S. civilians and focusing on individuals 50 years and older<sup>6,7,11-13</sup>. Given the evidence<sup>3,8,11</sup> indicating that consumption of marijuana may impede tobacco cessation attempts,

our findings underscore the importance of clinicians to screen for use of marijuana and tobacco products, with consideration for gender.

In addition to examining the prevalence of past-month marijuana, cigarette, and cigar use, we also examined the association between demographic and tobacco-use variables with past-month marijuana use. We found that identifying as male, being unmarried, past-month cigarette use, and cigar use, is positively associated with past-month marijuana use. Notably, our analyses also found that past-month cigarette use is the strongest predictor of past-month marijuana use. These findings are consistent with prior studies on marijuana and tobacco use among older adults<sup>6,7,11-13</sup>. Concurrent use of combustible tobacco and marijuana has been found to increase the likelihood of respiratory/pulmonary diseases<sup>8</sup>.

### Limitations

While strengths of NSDUH data include reliability and robustness, there are limitations to consider when interpreting the data. First, reliance on self-reported marijuana, cigarette, and cigar use, that was not biochemically verified, may have been subject to under- or over-reporting among respondents. Second, NSDUH data are cross-sectional in nature, and hence allowed investigation of only correlational not causal relationships. Therefore, we cannot determine the temporality of use among marijuana, cigarettes and cigars. The cross-sectional design also limits our ability to determine whether attempts to quit one substance increases the likelihood of affecting the use of another substance. Additionally, as more U.S. States enact policy authorizing marijuana for medicinal and recreational use, research<sup>14,15</sup> suggests that older adults are using marijuana for chronic medical conditions associated with aging. The NSDUH showed that from 2002 to 2012, past-month marijuana use decreased from 8.2% to 7.2% among adolescents aged 12-17 years, and increased by more than half, from 1.2% to 3.0%, among adults aged 50 years and older<sup>1</sup>. Thus, motives for marijuana use among older adults may be medical or recreational; or the use of tobacco products may lead to marijuana use, and the temporal association may vary by gender and race/ethnicity. Future research on these questions is needed. Future analyses from this cohort will also examine the

prevalence and trends of lifetime, past-year, and past-month marijuana and tobacco use. Third, the NSDUH sample is designed to be nationally representative of the civilian, non-institutionalized U.S. population, in that it does not include homeless and institutionalized (i.e. correctional facilities, nursing homes, mental health facilities) individuals. Therefore, our findings do not apply to them. Fourth, the number of past-month marijuana users was too small to permit detailed analysis of respondents aged 50-64 years only or 65 years and older.

### CONCLUSIONS

Despite these limitations, the present study findings provide an empirical basis to explore the relationship between older adult marijuana, cigarette and cigar use. Clinicians, tobacco control, and substance-use professionals should be aware of the substantial proportion of older adults who reported past-month cigarette use, especially given that study findings show past-month cigarette use is the strongest predictor of past-month marijuana use. Efforts should also be made to reduce cigar consumption, as the findings demonstrate a positive association between past-month cigar and marijuana use. The U.S. Public Health Service clinical practice guideline 'Treating Tobacco Use and Dependence: 2008 Update' recommended that clinicians identify the tobacco-use status of patients and treat every tobacco user<sup>16</sup>. Clinicians should routinely screen older adults for tobacco and marijuana use and dependence. The screening should occur in the context of an overall health assessment, with an objective to treat any associated illness, physical or mental. Additionally, tobacco prevention and control efforts that target older adults should be tailored effectively to address use of marijuana and other combustible tobacco products. Further, ongoing surveillance can assist in monitoring patterns of use among a growing and aging, yet understudied, population.

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**CONFLICTS OF INTEREST**

Authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none was reported.

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**PROVENANCE AND PEER REVIEW**

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