

RESEARCH REPORT

Cannabis use disorders

ADDICTION

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Cannabis use and cannabis use disorder among older adults in the USA

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Abstract

Background and aims: Cannabis use is increasing among older adults in the United States (US); however, little is known regarding details of use or cannabis use disorder (CUD) in this population. This study aimed to describe cannabis use and CUD among older adults in the US.

Design: Secondary analysis of the 2021–2024 National Survey on Drug Use and Health, an annual cross-sectional nationally representative sample of noninstitutionalized people aged ≥ 12 living in the US.

Setting: United States.

Participants: Noninstitutionalized individuals age ≥ 65 years (unweighted $N = 21\,189$).

Measurements: We estimated the prevalence of cannabis use by recency (any past 12-month use and past 30-day use), meeting two or more Diagnostic and Statistical Manual of Mental Disorders (DSM)-5 CUD criteria, as well as CUD severity and individual CUD criteria among adults age ≥ 65 years who used cannabis in the past 12 months. Cannabis use and CUD were compared across sociodemographic and health-related characteristics, modality of use (2022–2024 only), and individual CUD criteria. Bivariable generalized linear regression models estimated the relative risk (RR) of CUD for older adults with each characteristic and modality of cannabis use.

Results: An estimated 8.9% of older adults used cannabis in the past 12 months, and among them, 11.4% met criteria for CUD (76.0% mild, 20.1% moderate, and 3.9% severe CUD). Smoking was the most common modality of past 12-month use (65.8%), followed by eating or drinking (40.5%), and vaping (15.4%); 19.9% had a doctor recommend any cannabis use. Among older adults with CUD, the most common CUD criteria met were spending time obtaining, using, and recovering from the drug's effects (74.4%) and craving (67.5%). Male older adults were at higher risk for CUD than their female counterparts [RR = 1.69, 95% confidence interval (CI): 1.12–2.55], as were those ever arrested and booked (RR = 1.59, 95% CI = 1.07–2.37), with past-year mental illness (RR = 2.93, 95%

CI: 1.85–4.65), past-year tobacco use (RR = 1.52, 95% CI: 1.04–2.20) or drug use other than cannabis (RR = 3.22, 95% CI: 2.15–4.84), smoking as a mode of cannabis use (RR = 4.94, 95% CI: 2.39–10.23), and frequent cannabis use (e.g., ≥ 300 days vs. < 300 days per year, RR = 3.70, 95% CI: 2.30–5.96).

Summary: One in nine older adults in the United States who have used cannabis in the past 12 months meet criteria for cannabis use disorder. Cannabis use screening, cannabis use disorder treatment, and additional intervention to prevent worsening severity are needed to minimize cannabis-related harms among older US adults.

KEYWORDS

cannabis use, cannabis use disorder, DSM-5 criteria, epidemiology, nationally representative surveys, older adults

INTRODUCTION

Cannabis use in older adulthood is a growing phenomenon with important clinical and social considerations. Among adults aged ≥ 65 years in the USA, the prevalence of past 30-day cannabis use has recently increased from 4.8% in 2021 to 7.0% in 2023 [1]. Increases in cannabis use among older adults has occurred in the context of the medicalization and legalization of cannabis in most states in the USA [2], increases in cannabis use potency [3–5] and a growing interest in its use to manage chronic symptoms, including chronic pain, insomnia, anxiety and depression [6]. However, older adults may be at higher risk for harms related to cannabis use given age-related physiologic changes, as well as a higher prevalence of chronic diseases and the use of prescription medications [7]. Some noted harms from previous studies include increased risk for chronic diseases, cognitive impairment, falls, and increases in cannabis poisoning and cannabis-related acute healthcare visits [8–10].

One often overlooked cannabis-related harm among older adults is cannabis use disorder (CUD). The prevalence of CUD has increased among the US general population, especially among younger adults [11, 12], and mortality among people with CUD has increased [13, 14]. Despite this, little research has examined CUD among older adults, in part owing to much more focus on prevention in younger populations and the lower prevalence of cannabis use and substance use disorders among earlier birth cohorts [7]. A recent study estimated 11% of older adults who used cannabis in the past year met the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria for CUD in 2021–2023, but did not characterize age-specific correlates of CUD that may be clinically meaningful [15]. Another recent study estimated that 36.3% of older adults who used Veterans Health Administration care and used cannabis in the past 30 days met the criteria for CUD [16]. Older veterans who inhaled cannabis (i.e. smoked, vaped or dabbed) and engaged in frequent use had higher odds of CUD. However, whether these patterns reflect the broader older population in the USA is unknown.

Given the rapid changes in cannabis use among older adults, it is imperative to understand who may be at risk for developing CUD when weighing the risks and benefits of its use. Therefore, the

present study focuses on older adults to describe cannabis use, estimate CUD prevalence among older adults who use cannabis and identify correlates of CUD. By using the most current, nationally representative sample of non-institutionalized older adults in the USA, findings generalize to a growing group of older people who increasingly use cannabis.

METHODS

Data source and sample

We used the publicly available de-identified data files of the National Survey on Drug Use and Health (NSDUH) from 2021, 2022, 2023 and 2024. The NSDUH is an annual cross-sectional survey of non-institutionalized people in the USA aged 12 years and older, which uses a multi-stage area probability sampling to estimate a nationally representative sample, sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA) [17]. Detailed information on the validity and reliability of measures is available elsewhere [18]. Participants provided data through either a web-based questionnaire or face-to-face interviews in households using computer-assisted interviewing and audio computer-assisted survey instruments. The participants differ each year, and the questions used in this analysis are identical, allowing for pooled analyses to increase precision [19]. The weighted household screening response rates were 22.2% in 2021, 25.5% in 2022, 24.4% in 2023 and 21.9% in 2024, while the interview response rates were 46.2% in 2021, 47.4% in 2022, 50.5% in 2023 and 51.5% in 2024 [17]. This analysis included all participants in the 2021–2024 NSDUH aged 65 years and older at the time of interview (unweighted $n = 21\,189$). As medical cannabis use measures were moved to a different section starting in 2022, potentially affecting responses, and measures related to modes of cannabis use as well as cannabidiol (CBD) or hemp use were only asked in 2022–2024, analyses of these variables included all participants in the 2022–2024 NSDUH aged 65 years and older at the time of interview (unweighted $n = 15\,751$). This secondary data analysis of public de-identified data was considered exempt by the Rutgers Institutional Review Board.

This study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guidelines for cross-sectional studies.

Measures

Cannabis use recency

Cannabis use was assessed using the items 'Have you ever, even once, used marijuana or any cannabis product?' and 'How long has it been since you last used marijuana or any cannabis product?' Participants were instructed not to consider the use of CBD or hemp products when responding to these items. We used NSDUH recoded variables from these items to determine cannabis use recency, distinguishing any past 12-month use and any past 30-day use, which NSDUH defines as 'current use'.

Cannabis use frequency

Participants were asked to report the exact number of days cannabis was used in the past 12 months, which was recoded as <300 days or ≥300 days, with ≥300 days being a common threshold for 'daily or near-daily use' [3, 20, 21]. The reported number of days of cannabis use in the past 30 days was recoded to 1–19 days, 20–29 days or 30 days.

Modes of cannabis use (2022–2024 only)

The seven modes of cannabis use assessed in the past 12 months and past 30 days of use included: smoking; eating or drinking; vaping; lotion, cream or patch to skin; drop, strips, lozenges or sprays in mouth; dabbing waxes, shatter or concentrate; and pills.

Medical cannabis use (2022–2024 only)

Cannabis use recommended by a doctor in the past 12 months was ascertained from two questions regarding whether any or all cannabis use was recommended by a doctor.

DSM-5 cannabis use disorder

Cannabis use disorder (CUD) was assessed using items based on the 11 DSM-5 CUD criteria [16, 22, 23]. Individuals who met ≥2 of the 11 criteria are classified as having CUD. CUD severity was based on the number of criteria met and included mild (2–3 criteria), moderate (4–5 criteria) or severe (6–11 criteria). While NSDUH-imputed revised variables were used for CUD and CUD severity, individual DSM-5 CUD criteria were determined using non-imputed

response variables following established procedures [15]. Missingness for individual CUD criteria was captured using indicators for missing values.

CBD or hemp product use

Lifetime, past 12-month and past 30-day use of CBD or hemp products was assessed with the same question format as that for cannabis use, but explaining that questions were specifically about CBD or hemp products made from hemp plants, and that CBD and hemp products have no or small amounts of tetrahydrocannabinol (THC), and were not intended for psychoactive use. Examples of CBD forms provided included oils, lotions, edibles and isolates, and example reasons of use included to relieve pain, to reduce anxiety or to help them sleep.

Other substance use

Other substance use measures included past 12-month tobacco use, past 30-day binge alcohol use (defined as ≥5 drinks on the same occasion for men and ≥4 for women) and past 12-month use of illegal drugs other than cannabis.

Health conditions

The NSDUH asks about chronic health conditions, which include cancer, hypertension, heart disease, diabetes, chronic obstructive pulmonary disease (COPD), cirrhosis, kidney disease and asthma. While lifetime diagnosis of these conditions was queried, questions were also asked assessing more recent cancer (in the past 12 months), and those with lifetime hypertension were asked if they currently use medications to treat high blood pressure. These two indicators were used to confirm the current chronic condition instead of focusing on a lifetime diagnosis for these two conditions. We created an indicator for being diagnosed with two or more of the above chronic health conditions. We used the NSDUH-imputed revised binary variable indicating any past-year mental illness, which is based on a 2012 statistical model for predicting mental illness described in detail in the NSDUH documentation [23].

Socio-demographic characteristics

The socio-demographic variables used were sex (female or male), race/ethnicity (non-Hispanic Asian, Native Hawaiian or Pacific Islander; non-Hispanic Black or African American; Hispanic; non-Hispanic American Indian or Alaska Native; multi-racial; non-Hispanic White), annual income (<\$20,000; \$20,000–49,999; \$50,000–74,999; ≥\$75 000), lifetime arrest and booking history, metropolitan statistical area (large metropolitan area; small metropolitan area; non-

metropolitan area) and whether the participant resided in a state where medical cannabis use was legal at the time of interview. Insurance status was not included in this analysis because over 90% of the sample reported any public insurance (e.g. Medicare).

Statistical analysis

All analyses used *svy* procedures in Stata 19 (StataCorp LLC, College Station, TX, USA) using the NSDUH sampling weights to account for the complex survey design and to yield representative estimates of the US population. We estimated characteristics overall and the percentage of older adults with each characteristic by cannabis use recency. We calculated the frequency and modes of cannabis use, use recommended by a doctor, and CBD or hemp use according to cannabis use recency. Modes of cannabis use, medical cannabis use, and CBD or hemp use were only comparable from 2022 to 2024, so analyses of these variables used data from only those years. Then, we estimated the prevalence of CUD (overall and by severity), as well as the prevalence of each of the 11 individual CUD criteria, first among the subset with past 12-month cannabis use and then among those meeting CUD criteria. Last, we estimated CUD prevalence among subgroups distinguished by socio-demographic, substance use, health status characteristics, and by frequency and mode of cannabis use. We used bivariable generalized linear regression models with a binomial distribution and log link to estimate relative risk (RR) and corresponding 95% confidence intervals (95% CIs) for CUD for older adults with each characteristic. Missing data were coded using missingness indicators, and we calculated estimated prevalence of these indicators (range = 0.1%–4.3%). Unreliable estimates were suppressed according to the 2024 NSDUH suppression rules [24]. As analyses were not pre-registered, results should be considered exploratory.

RESULTS

Overall, 8.9% of older adults were estimated to have used cannabis in the past 12 months, the majority of whom (67.4%) also have used it in the past 30 days (6.0% of all older adults) (Table 1). Prevalence estimates appeared notably higher compared with the overall average among those who had used other drugs in the past 12 months (31.0%), those with lifetime arrest and booking (21.8%), those who engaged in past 30-day binge alcohol use (19.7%) or past 12-month tobacco use (18.7%).

Frequency, modes of use, medical use of cannabis, and CBD or hemp use

An estimated 20.4% of older adults who used cannabis in the past 12 months reported ≥ 300 days of use, and 26.5% among those who used in the past 30 days used cannabis daily (Table 2). Among older adults who used cannabis in the past 12 months, the most common

mode of use was smoking (65.8%), followed by eating or drinking (40.5%) and vaping (15.4%). The distribution of mode of use was similar for those who used it in the last 30 days. One in five (19.9%) older adults who used cannabis in the past 12 months had any use recommended by a doctor, and 14.3% had all cannabis use recommended by a doctor. CBD or hemp use was common among older adults who used cannabis in the past 12 months, with three-quarters (74.9%) with lifetime use, 57.4% with past 12-month use and 39.1% with past 30-day use.

Cannabis use disorder and DSM-5 criteria

An estimated 11.4% of older adults who used cannabis in the past 12 months met the criteria for CUD (Table 3). Among older adults with CUD, 76.0% had mild CUD, 20.1% had moderate CUD and 3.9% had severe CUD. The CUD criteria met by the highest percentages of older adults with CUD were spending time obtaining and using the drug (74.4%), craving (67.5%) and tolerance (48.3%).

Correlates of CUD

Among older adults who used cannabis in the past 12 months, CUD was more likely for male older adults compared with female older adults (RR = 1.69, 95% CI = 1.12–2.55), those with lifetime arrest and booking (RR = 1.59, 95% CI = 1.07–2.37), those with past-year mental illness (RR = 2.93, 95% CI = 1.85–4.65), as well as those who used tobacco in the past 12 months (RR = 1.52, 95% CI = 1.04–2.20), drugs other than cannabis in the past 12 months (RR = 3.22, 95% CI = 2.15–4.84) and/or CBD or hemp in the past 30 days (RR = 1.70, 95% CI = 1.12–2.57) (Table 4). Older adults using cannabis more frequently had a greater likelihood of CUD (≥ 300 days vs. < 300 days in the past 12 months, RR = 3.70, 95% CI = 2.30–5.96; 20–29 days vs. 1–19 days in the past 30 days, RR = 4.61, 95% CI = 2.64–8.06; 30 days vs. 1–19 days in the past 30 days, RR = 5.03, 95% CI = 2.81–9.03). CUD was less likely for older adults with an annual income of $\geq \$50,000$ (\$50,000–74,999 vs. $< \$20,000$, RR = 0.46, 95% CI = 0.24–0.87; $\geq \$75,000$ vs. $< \$20,000$, RR = 0.35, 95% CI = 0.19–0.64) and among those who had cancer in the past 12 months (RR = 0.40, 95% CI = 0.18–0.89).

DISCUSSION

Focusing on a nationally representative sample of older adults aged 65 years and older from 2021 to 2024, we found that about one in 11 older adults used cannabis in the past year, and over two-thirds of these individuals used it in the past month. One in nine older adults who used cannabis in the past 12 months (11.4%) met the criteria for CUD, nearly a quarter of whom met the criteria for moderate or severe CUD. Our results provide updated and detailed information on how older adults use cannabis and the likelihood of meeting CUD

TABLE 1 Socio-demographic, substance use and health status characteristics of older adults aged 65 years and older by cannabis use recency.

Sociodemographic characteristics	Older adults reporting cannabis use	
	Past 12-month use Row wt.% (95% CI)	Past 30-day use Row wt.% (95% CI)
Total	8.9 (8.3–9.5)	6.0 (5.5–6.5)
Survey year		
2021	7.2 (6.0–8.7)	4.8 (3.9–5.9)
2022	8.0 (6.7–9.6)	5.2 (4.2–6.3)
2023	9.7 (8.6–10.8)	7.0 (6.2–7.9)
2024	10.5 (9.4–11.7)	7.0 (6.1–7.9)
Sex		
Male	10.9 (9.8–12.2)	7.8 (6.9–8.8)
Female	7.2 (6.5–7.9)	4.5 (3.9–5.1)
Race/ethnicity		
Hispanic	7.2 (5.2–9.9)	4.8 (3.4–6.8)
Non-Hispanic Black or African American	9.6 (7.8–11.6)	6.6 (5.1–8.5)
Non-Hispanic White	9.3 (8.6–10.0)	6.3 (5.7–6.9)
Another race/ethnicity ^a	5.8 (4.4–7.7)	3.9 (2.7–5.6)
Annual income		
\$0–19,999	9.5 (7.7–11.7)	6.7 (5.1–8.6)
\$20,000–49,999	7.8 (6.9–8.9)	5.3 (4.5–6.2)
\$50,000–74,999	8.9 (7.5–10.5)	6.3 (5.1–7.7)
≥\$75,000	9.6 (8.7–10.7)	6.3 (5.5–7.2)
Lifetime arrest and booking ^b	21.8 (18.6–25.3)	14.7 (12.2–17.5)
Metropolitan statistical area		
Large metropolitan area	9.0 (8.1–10.0)	6.3 (5.5–7.2)
Small metropolitan area	9.0 (8.1–10.0)	5.9 (5.2–6.6)
Non-metropolitan area	8.1 (7.1–9.3)	5.3 (4.5–6.3)
Resides in a state where medical cannabis is legal		
Yes	10.0 (9.2–10.8)	6.9 (6.3–7.6)
No	5.6 (4.8–6.6)	3.3 (2.8–4.1)
Other substance use		
Past 12-month tobacco use	18.7 (16.8–20.8)	12.8 (11.1–14.6)
Past 30-day binge alcohol use	19.7 (17.3–22.4)	14.4 (12.5–16.5)
Past 12-month use of other illicit drugs	31.0 (26.4–36.1)	22.4 (18.1–27.5)
Chronic health conditions ^c		
Cancer (past 12-month)	10.2 (7.8–13.2)	7.3 (5.2–10.1)
Hypertension (current medication use)	7.9 (7.0–8.9)	5.4 (4.6–6.2)
Heart disease (lifetime)	8.5 (7.4–9.6)	5.5 (4.7–6.3)
Diabetes (lifetime)	7.3 (6.1–8.6)	5.0 (4.1–6.1)
Chronic obstructive pulmonary disease (lifetime)	12.2 (10.2–14.5)	8.2 (6.7–10.1)
Cirrhosis (lifetime)	15.6 (9.7–24.3)	10.7 (6.0–18.2)
Kidney disease (lifetime)	7.2 (5.4–9.7)	4.7 (3.3–6.5)
Asthma (current)	9.3 (6.8–12.5)	6.4 (4.3–9.5)
Number of chronic conditions ^d		
≥2	8.5 (7.4–9.8)	5.5 (4.7–6.5)
0–1	9.0 (8.3–9.7)	6.2 (5.6–6.8)

(Continues)

TABLE 1 (Continued)

Sociodemographic characteristics	Older adults reporting cannabis use	
	Past 12-month use Row wt.% (95% CI)	Past 30-day use Row wt.% (95% CI)
Past-year mental illness		
None	8.4 (7.7–9.1)	5.6 (5.1–6.2)
Any	12.8 (10.9–15.0)	9.2 (7.7–11.0)

Note: Unweighted total sample of $n = 21\,189$. Data from the 2021–2024 National Survey on Drug Use and Health.

^aIncludes multi-racial, non-Hispanic American Indian or Alaska Native, and non-Hispanic Asian, Native Hawaiian or Pacific Islander.

^bThe estimated missingness for lifetime arrest and booking was 1.2%.

^cThe estimated missingness for the chronic health condition variables was 2.1%–2.2%.

^dThe total number of known chronic conditions based on ‘yes’ responses; the estimated missingness for number of chronic conditions was 4.0%.

TABLE 2 Frequency and modes of cannabis use, medical cannabis use, and cannabidiol (CBD) or hemp use among older adults aged 65 years and older by cannabis use recency.

	Past 12-month cannabis use ^a Column wt.% (95% CI)	Past 30-day cannabis use ^b Column wt.% (95% CI)
Frequency of cannabis use^a		
Past 12-month frequency		
<300 days	79.6 (76.7–82.2)	–
≥300 days	20.4 (17.8–23.3)	–
Past 30-day frequency ^a		
1–19 days	–	57.9 (53.2–62.4)
20–29 days	–	15.6 (12.8–19.0)
30 days	–	26.5 (22.4–31.1)
Mode of cannabis use^b		
Smoking	65.8 (62.6–68.9)	64.6 (60.3–68.6)
Eating or drinking	40.5 (36.7–44.3)	36.4 (32.3–40.7)
Vaping	15.4 (13.1–18.0)	17.0 (14.0–20.3)
Lotion, cream or patch to skin	11.8 (9.9–14.0)	9.9 (7.9–12.3)
Drop, strips, lozenges or sprays in mouth	7.3 (5.7–9.4)	6.5 (4.9–8.8)
Dabbing waxes, shatter or concentrate	3.0 (2.0–4.5)	2.7 (1.6–4.6)
Pills	2.6 (1.8–3.9)	2.3 (1.4–3.6)
Medical cannabis use^{b,c}		
Any cannabis use in past 12 months recommended by doctor	19.9 (17.4–22.7)	24.5 (20.5–29.0)
All cannabis use in past 12 months recommended by doctor	14.3 (12.0–17.1)	17.6 (13.8–22.0)
CBD or hemp use^b		
Lifetime CBD or hemp use	74.9 (71.5–78.0)	76.8 (72.1–80.9)
Past 12-month CBD or hemp use	57.4 (53.0–61.6)	60.9 (55.5–66.0)
Past 30-day CBD or hemp use	39.1 (35.1–43.3)	48.5 (43.8–53.3)

Note: Percentages of modes of cannabis use (i.e. smoking; eating or drinking; vaping; lotion, cream or patch to skin; drop, strips, lozenges or sprays in mouth; dabbing waxes, shatter or concentrate; and pills) are from measures of past 12-month use of that mode among older adults who report any past 12-month cannabis use and from measures of past 30-day use of that mode among older adults who report any past 30-day cannabis use.

CBD = cannabidiol.

^aData from the 2021–2024 National Survey on Drug Use and Health; for past 12-month cannabis use, unweighted $n = 1923$; for past 30-day cannabis use, unweighted $n = 1318$.

^bData from the 2022–2024 National Survey on Drug Use and Health; for past 12-month cannabis use, unweighted $n = 1515$; for past 30-day cannabis use, unweighted $n = 1043$.

^cThe estimated missingness for medical cannabis use was 0.1%–0.3%.

TABLE 3 Past 12-month DSM-5 cannabis use disorder severity and diagnostic criteria among older adults aged 65 years and older.

	Past 12-month cannabis use ^a	Past 12-month DSM-5 CUD ^b
	Column wt.% (95% CI)	Column wt.% (95% CI)
DSM-5 CUD severity		
Any (2 or more criteria)	11.4 (9.6–13.5)	100.0
Mild (2–3 criteria)	8.7 (6.9–10.8)	76.0 (64.7–84.5)
Moderate (4–5 criteria)	2.3 (1.4–3.7)	20.1 (12.1–31.5)
Severe (6 or more criteria)	0.5 (0.2–1.0)	3.9 (1.8–8.3)
DSM-5 CUD criteria^c		
Criterion 1	3.8 (2.5–5.6)	29.4 (19.5–41.7)
Limits: often taken in larger amounts or over a longer period than was intended		
Criterion 2	3.0 (2.1–4.2)	21.8 (14.5–31.5)
Cutting down: a persistent desire or unsuccessful efforts to cut down or control use		
Criterion 3	13.4 (11.2–16.0)	74.4 (65.5–81.7)
Spending time: a great deal of time is spent in activities necessary to obtain, use or recover from effects of the substance		
Criterion 4	13.4 (11.7–15.3)	67.5 (58.8–75.2)
Craving: craving or a strong desire or urge to use the substance		
Criterion 5	0.5 (0.2–1.3)	– ^d
Problems at home, work or school: recurrent use resulting in a failure to fulfill major role obligations at work, school or home		
Criterion 6	0.4 (0.1–1.5)	– ^d
Problems with friends and family: continued use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by its effects		
Criterion 7	1.0 (0.5–1.9)	7.7 (4.0–14.2)
Activities: important social, occupational or recreational activities are given up or reduced because of use		
Criterion 8	0.02 (0.01–0.1)	0.2 (0.1–0.5)
Physical danger: recurrent use in situations in which it is physically hazardous		
Criterion 9	1.3 (0.6–2.6)	11.0 (5.6–20.7)
Health problems: continued use despite knowledge of having a persistent or recurrent physical or psychologic problem that is likely to have been caused or exacerbated by the substance		
Criterion 10	7.7 (6.2–9.7)	48.3 (38.4–58.4)
Tolerance		
Criterion 11	3.0 (2.0–4.4)	21.0 (13.7–30.8)
Withdrawal		

Note: Data from the 2021–2024 National Survey on Drug Use and Health. Abbreviations: CUD = cannabis use disorder; DSM-5 = Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition.

^aUnweighted $n = 1923$.

^bUnweighted $n = 217$.

^cThe estimated missingness for individual DSM-5 CUD criteria was 1.4%–4.1%.

^dSuppressed following 2024 National Survey on Drug Use and Health suppression rules [24].

criteria. In terms of specific DSM-5 criteria, spending time obtaining and using cannabis, craving and tolerance were the most endorsed criteria, which is consistent with younger populations in other studies [25, 26]. Much less common are problems related to social, occupational and/or relationships, and/or failure to fulfill obligations at work, home or school. It is important to note that some DSM-5 criteria for CUD may be less relevant to older adults than younger age groups because of changes in role obligations and social networks (e.g. owing to retirement) [7]. Furthermore, although 4 years of survey data were

used, the prevalence of only nine out of 11 individual criteria were reliably estimated. A more detailed understanding of the prevalence of individual CUD criteria among older adults may help inform tailored prevention and treatment efforts for geriatric populations. For example, older adults may experience a decrease rather than an increase in tolerance because of physiological changes related to aging and increased brain sensitivity to psychoactive substances [7].

While the majority of older adults who used cannabis in our study smoked cannabis, other routes of use are common, including ingestion

TABLE 4 Correlates of DSM-5 cannabis use disorder among older adults aged 65 years and older who report past 12-month cannabis use.

	Past 12-month DSM-5 CUD	
	Row wt.% (95% CI)	RR (95% CI)
Sociodemographic characteristics		
Survey year		
2021	11.4 (7.4–17.2)	1 (ref.)
2022	8.0 (5.4–11.5)	0.70 (0.38–1.29)
2023	13.3 (8.9–19.3)	1.16 (0.65–2.08)
2024	12.3 (8.7–17.1)	1.08 (0.64–1.82)
Sex		
Male	13.9 (11.3–17.0)	1.69 (1.12–2.55)
Female	8.3 (5.9–11.5)	1 (ref.)
Race/ethnicity		
Hispanic	11.7 (5.6–23.0)	1.12 (0.54–2.33)
Non-Hispanic Black or African American	15.5 (8.7–26.1)	1.48 (0.79–2.79)
Non-Hispanic White	10.4 (8.4–12.9)	1 (ref.)
Another race/ethnicity ^a	– ^g	– ^g
Annual income		
\$0–19,999	19.2 (12.8–27.7)	1 (ref.)
\$20,000–49,999	15.1 (11.1–20.4)	0.79 (0.46–1.35)
\$50,000–74,999	8.8 (4.9–15.6)	0.46 (0.24–0.87)
≥\$75,000	6.6 (4.4–9.9)	0.35 (0.19–0.64)
Lifetime arrest and booking ^b	15.5 (11.5–20.4)	1.59 (1.07–2.37)
Metropolitan statistical area		
Large metropolitan area	10.6 (7.8–14.3)	1 (ref.)
Small metropolitan area	11.6 (9.1–14.6)	1.09 (0.73–1.62)
Non-metropolitan area	13.9 (9.1–20.5)	1.30 (0.80–2.12)
Resides in a state where medical cannabis is legal at time of interview		
Yes	11.9 (9.9–14.3)	1.37 (0.74–2.53)
No	8.7 (4.9–15.2)	1 (ref.)
Other substance use		
Past 12-month tobacco use	15.1 (11.1–20.3)	1.52 (1.04–2.20)
Past 30-day binge alcohol use	7.8 (4.7–12.7)	0.62 (0.36–1.05)
Past 12-month use of other illicit drugs	29.6 (19.6–42.1)	3.22 (2.15–4.84)
Chronic health conditions		
Cancer (past 12-month)	4.6 (2.1–10.0)	0.40 (0.18–0.89)
Hypertension (current medication use)	11.5 (7.7–16.8)	1.05 (0.66–1.67)
Heart disease (lifetime)	12.0 (8.3–17.1)	1.11 (0.70–1.76)
Diabetes (lifetime)	12.9 (8.3–19.6)	1.20 (0.72–2.00)
Chronic obstructive pulmonary disease (lifetime)	15.1 (9.4–23.5)	1.43 (0.90–2.28)
Cirrhosis (lifetime)	– ^g	– ^g
Kidney disease (lifetime)	6.5 (2.8–14.1)	0.57 (0.25–1.32)
Asthma (current)	10.2 (4.8–20.3)	0.91 (0.43–1.92)
Number of chronic conditions		
≥2	13.0 (8.6–19.2)	1.23 (0.77–1.99)
0–1	10.5 (8.6–12.9)	1 (ref.)

TABLE 4 (Continued)

	Past 12-month DSM-5 CUD	
	Row wt.% (95% CI)	RR (95% CI)
Past-year mental illness		
None	8.7 (6.8–10.9)	1 (ref.)
Any	25.4 (17.6–35.2)	2.93 (1.85–4.65)
Frequency of cannabis use		
Past 12-month frequency		
<300 days	7.4 (5.3–10.1)	1 (ref.)
≥300 days	27.2 (20.9–34.7)	3.70 (2.30–5.96)
Past 30-day frequency		
1–19 days	5.9 (3.7–9.2)	1 (ref.)
20–29 days	27.0 (18.7–37.2)	4.61 (2.64–8.06)
30 days	29.5 (22.3–37.8)	5.03 (2.81–9.03)
Modes of past 12-month cannabis use^e		
Smoking	15.7 (12.6–19.5)	4.94 (2.39–10.23)
Eating or drinking	10.6 (7.7–14.3)	0.88 (0.58–1.35)
Vaping	15.3 (10.7–21.3)	1.42 (0.94–2.15)
Lotion, cream or patch to skin	8.8 (5.5–13.9)	0.75 (0.42–1.33)
Drop, strips, lozenges or sprays in mouth	11.3 (5.9–20.4)	0.99 (0.51–1.92)
Dabbing waxes, shatter or concentrate	– ^g	– ^g
Pills	11.7 (6.0–21.5)	1.02 (0.53–1.98)
Medical cannabis use^{e,f}		
Any cannabis use in past 12 months recommended by doctor	13.8 (9.2–20.1)	1.27 (0.79–2.05)
All cannabis use in past 12 months recommended by doctor	12.6 (7.8–19.6)	1.11 (0.67–1.87)
CBD or hemp use		
Lifetime CBD or hemp use	12.2 (9.8–15.0)	1.32 (0.78–2.23)
Past 12-month CBD or hemp use	12.6 (9.9–15.9)	1.28 (0.86–1.90)
Past 30-day CBD or hemp use	15.2 (11.1–20.5)	1.70 (1.12–2.57)

Note: Values in bold indicate that the 95% CI does not include 1. Data from the 2021–2024 National Survey on Drug Use and Health for most variables (unweighted $n = 1923$) except for past 12-month modes of cannabis use, medical cannabis use, and CBD or hemp use. Abbreviations: CBD = cannabidiol; CUD = cannabis use disorder; DSM-5 = Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition.

^aIncludes multi-racial, non-Hispanic American Indian or Alaska Native, and non-Hispanic Asian, Native Hawaiian or Pacific Islander.

^bThe estimated missingness for lifetime arrested and booked was 1.6%.

^cThe estimated missingness for the chronic health condition variables was 1.97%–2.0%.

^dThe total number of known chronic conditions based on ‘yes’ responses; the estimated missingness for number of chronic conditions was 4.3%.

^eFor past 12-month modes of cannabis use, medical cannabis use, and CBD or hemp use, data are from the 2022–2024 National Survey on Drug Use and Health (unweighted $n = 1515$).

^fThe estimated prevalence of missing indicators for the medical cannabis use variables was 0.3%.

^gSuppressed following 2024 National Survey on Drug Use and Health suppression rules [24].

and the use of topical products, consistent with other analyses of NSDUH data and different study samples of older adults [16, 27–29]. Meanwhile, only a quarter of older adults who used cannabis in the past 30 days had it recommended for medical purposes by a clinician, lower than in previous research demonstrating that older adults largely use cannabis for medical or chronic symptoms [6]. However, it is likely that many older adults use cannabis to manage chronic symptoms without a clinician’s recommendation or participants may only answer in the affirmative if they have a medical cannabis certification. Therefore, our analysis may not capture all older adults who are using

cannabis mainly for medical reasons, which remains an important area of future research.

The health-related correlates of CUD among older adults included tobacco use, other illegal drug use, mental illness, smoking cannabis, and CBD or hemp use. These findings align with behavioral health comorbidities, particularly among adults of male sex, ever arrested and booked, and lower income groups who also had a higher likelihood of CUD. While the risk of CUD was elevated among older adults who vaped cannabis, the relative risk of CUD was not statistically significant, likely because of a lower power to detect associations among

the subgroup of people reporting cannabis. Further attention may be needed for older adults who vape, as other studies have found positive associations between the use of products with higher THC concentrations and CUD [30, 31]. Cancer was negatively associated with CUD, reasons for which should be explored further in future studies. However, this negative association was not seen with other chronic health conditions, which calls for integrated care to reduce CUD burden.

The treatment of CUD focuses primarily on behavioral and psychosocial interventions, including brief intervention, cognitive behavioral therapy (CBT), motivational enhancement therapy (MET) or combined CBT/MET [32]. Currently, pharmacological therapies for CUD symptoms remain limited [33]. Generally, older adults respond well to these interventions for alcohol use disorder [34, 35], but they have not been evaluated specifically for older adults with CUD. Indeed, there is an urgent need to ensure that older adults have access to psychosocial interventions tailored to them [36]. Yet, with the growing number of older adults who use cannabis, a recent study found that among older adults who used cannabis in the past year, only 37.3% were screened for cannabis or illegal drug use, and 19.2% had discussed their cannabis use with clinicians [37]. Developing CUD is a potential consequence of using cannabis, and clinicians should screen for unhealthy cannabis use with their older patients [38], and for those who use cannabis discuss its use in a health context. Given the changing legality of cannabis and its use for medical purposes, grouping cannabis with 'illicit' drugs that many current screening instruments still do, may no longer be appropriate [39].

Limitations

Our study is limited to self-reported measures of cannabis use and symptoms of CUD, which may be subject to recall bias and social desirability bias. Additionally, a previous study of NSDUH respondents found that older participants were more likely to experience survey fatigue, which could affect responses [40]. Institutionalized older adults were excluded, so our findings may not generalize to these populations. We were unable to distinguish narrower age categories of older adults, which may underestimate cannabis use and CUD in younger subgroups (e.g. 65–74 years vs. 75+ years). We may have been underpowered to detect certain correlates of CUD among the subset of people who used cannabis. Even though we pooled 4 years of nationally representative data, measurement limitations remained when estimating criteria-specific prevalence in the subsample of older adults with past 12-month CUD. Future studies pooling additional years of data should address this limitation. Meeting self-reported CUD criteria thresholds may not fully correspond with gold-standard structured diagnostic interviews, including accounting for clinically significant impairment, or in cases where tolerance or withdrawal related to prescribed cannabis therapy does not indicate CUD unless accompanied by other criteria [41]. It also does not mean that people had a diagnosis in the medical record. Instead, taking a community-based approach allowed us to ascertain CUD among

people who may not be connected with substance use or mental health services. required for a formal clinical diagnosis, informing clinical needs from an epidemiologic perspective.

CONCLUSION

In conclusion, cannabis use and CUD are at the highest levels recorded among older adults in the USA. While the majority of CUD cases are mild and could benefit from early intervention, nearly a quarter of cases are moderate or severe and likely require additional intervention to prevent worsening severity and co-occurring problems. Clinicians and program planners should facilitate cannabis-related information and programming to meet the growing CUD-related burden in this population.

AUTHOR CONTRIBUTIONS

Benjamin H. Han: Conceptualization; writing—review and editing; writing—original draft; funding acquisition. **Evan L. Eschliman:** Writing—review and editing; data curation; methodology; formal analysis; conceptualization. **Joseph J. Palamar:** Conceptualization; writing—review and editing; supervision; funding acquisition. **Mireia Triguero Roura:** Writing—review and editing. **Pia M. Mauro:** Writing—review and editing; funding acquisition; methodology; data curation; supervision; formal analysis; conceptualization.

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DECLARATION OF INTERESTS

J.J.P. has consulted for the Washington–Baltimore High Intensity Drug Trafficking Areas program. The other authors have no potential conflicts to declare.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available in National Survey on Drug Use and Health at <https://www.samhsa.gov/data/data-we-collect/nsduh-national-survey-drug-use-and-health/datafiles>. These data were derived from the following resources available in the public domain: National Survey on Drug Use and Health, <https://nsduhweb.rti.org/respweb/homepage.cfm>.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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