

Use of Cannabis for Medical or Recreational Purposes Among US Young Adults: Correlates and Implications for Problematic Use and Interest in Quitting

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Objective: Recreational and medical cannabis use has increased, particularly among young adults, but little is known regarding who uses for these purposes or how purpose of use is associated with problematic use.

Method: We analyzed Fall 2019 survey data among 1,083 US young adults (ages 18-34) reporting past 6-month cannabis use. Multivariable regression analyses examined: 1) characteristics of those using for only/primarily medical purposes, primarily recreationally, and only recreationally vs. equally for medical and recreational purposes (referent; multinomial logistic); and 2) reasons for use in relation to cannabis use disorder symptoms (linear) and driving under the influence of cannabis (DUIC; binary logistic). **Results:** 37.1% used only recreationally, 23.5% primarily recreationally, 21.5% equally for both, and 17.8% medically. Compared to those using equally for medical and recreational purposes, those using only/primarily medically had fewer friends who used cannabis; those using primarily recreationally were younger, more educated, less likely used tobacco, and reported fewer ACEs. Those using only recreationally were younger, more likely male, less likely to report an ADHD diagnosis or past-month alcohol or tobacco use, and reported fewer friends who used cannabis, ACEs, and depressive symptoms. Using equally for medical and recreational purposes (vs. all other cannabis use subgroups) correlated with greater use disorder symptoms and DUIC. **Conclusions:** Using cannabis equally for medical and recreational purposes may pose particularly high-risk, given the association with greater mental health concerns and problematic use. Understanding use profiles and how young adults interpret and distinguish medical and recreational use is critical.

Key words: = cannabis use; medical and recreational cannabis; cannabis use characteristics; risk factors; young adults

Cannabis is the most commonly used federally illicit drug in the US. In 2021, past-year cannabis use prevalence was 18.7% among US individuals ages 12 or older, which was highest among those

ages 18-25 (35.4%), 26 and older (17.2%), and 12-17 (10.5%) (SAMHSA, 2021). Although cannabis is federally prohibited, as of November 2022, 21 states and 3 territories (including the District of

Columbia) have legalized recreational use, and ~40 states and 4 territories have legalized medical use (Hansen et al., 2022). Despite some potential medical benefits of cannabis use (e.g., epilepsy, multiple sclerosis, chronic pain; Banerjee & McCormack, 2019; Bilbao & Spanagel, 2022), cannabis use poses potential negative consequences, especially for young people (Hall & Lynskey, 2020), including impaired memory and attention, decreased motivation and productivity, mental health problems (e.g., anxiety, depression, psychosis), increased risk of addiction (Stuyt, 2018), and driving under the influence of cannabis (DUI) and related motor vehicle accidents (Azofeifa et al., 2019).

As legalized recreational and medical cannabis has expanded in the US, the use of cannabis for both recreational and medical purposes has become increasingly prevalent among young adults (Schauer, 2021). Although cannabis is predominantly used recreationally, it is increasingly used for relief from various physical and mental health conditions (Leung et al., 2022; Lin et al., 2016; Paul et al., 2020). For example, a 2016 analysis of data from a nationally-representative US sample found that, in states with medical cannabis legislation, 17% of individuals used cannabis for medical reasons, while 83% used it recreationally (Lin et al., 2016). A 2018 analysis of nationally-representative data from adults in the US and Canada indicated that 27% had ever used cannabis for medical purposes (Leung et al., 2022).

It is important to understand who uses cannabis for medical vs. recreational purposes and the potential profiles of use that might entail the highest risk, for example, in terms of addiction, long-term chronic use (vs. quitting), and high-risk behaviors like driving under the influence. In terms of correlates of use for medical or recreational purposes, the existing literature is limited. One prior study using nationally-representative data indicated greater odds of medical use among men vs. women and those ages 26-35 vs. other age groups (Leung et al., 2022).

Related to markers of addiction, although the majority of those using cannabis do not experience signs of addiction, recent epidemiological patterns indicate a growing population living with some form of cannabis use disorder (Compton et al., 2019). One study found that, among US adults using cannabis in a nationally-representative

sample, past-year prevalence of cannabis use disorder was ~10% (Compton et al., 2019). Interestingly, while one national study found that individuals who used cannabis for medical reasons had a higher prevalence of daily or almost daily use (33%) compared to those who used cannabis recreationally (11%; Lin et al., 2016), other research has found that those using cannabis medically (vs. recreationally) have lower rates of problematic cannabis use and related harm (Connor et al., 2021).

A particular concern is DUI, as cannabis use increases the risk of being involved in a motor vehicle crash (Asbridge et al., 2012). In 2018, 12 million (4.7%) US adults reported DUI in the past year, which was more prevalent among those ages 16-34 and men (Azofeifa et al., 2019). Relevant to the current study, prior analyses of nationally-representative data have documented that DUI is more prevalent among those who use cannabis for medical vs. recreational purposes (27% vs. 9.7%; Wickens et al., 2022) and among individuals with symptoms of cannabis use disorder (Salas-Wright et al., 2021).

Interest in quitting cannabis use is also an important area of investigation, as lack of interest may have implications for ongoing, chronic, and potentially escalating use. Many people who use cannabis on a regular basis are interested in reducing or quitting their use (Masters et al., 2018; McClure et al., 2019; Zvolensky et al., 2018). For example, one study of young adults using cannabis documented that 22% reported quit attempts in the past 4 months and 19% reported readiness to quit in the next month (Masters et al., 2018). Another study found that 16% of those co-using cannabis and tobacco had attempted to stop using cannabis in the previous year, and 11% intended to in the next month (McClure et al., 2019). However, cannabis cessation-related outcomes have not been investigated in relation to primary purposes for use.

Notably, most of the prior literature has documented whether people have used medically or recreationally, with very little research examining how individuals describe the reasons for their current use in terms of how often they use medically vs. recreationally. Further, there is limited research characterizing individuals who use cannabis medically vs. recreationally or how reasons for use are associated with indicators of problematic use. This study aims to advance the

literature by addressing these gaps. Specifically, this study examined: 1) correlates (i.e., sociodemographics, psychosocial factors, use characteristics) of young adults' reasons for using cannabis (i.e., recreational, medical, or both); and 2) indicators of problematic use (i.e., levels of use, symptoms of dependence, DUIC, considering quitting) in relation to young adults' reasons for use (i.e., recreational, medical, or both).

METHODS

Study Design

The current study is an analysis of survey data among 3,006 young adults (aged 18-34) participating in a 2-year, 5-wave longitudinal cohort study, the Vape shop Advertising, Place characteristics and Effects Surveillance (VAPES) study. VAPES examines the vape retail environment and its impact on substance use, drawing participants from 6 metropolitan statistical areas MSAs (Atlanta, Boston, Minneapolis, Oklahoma City, San Diego, Seattle), selected for their variation in state tobacco control and cannabis retail legislation. This study, detailed elsewhere (Berg et al., 2020), involved survey data collection launched in Fall 2018 with assessments every 6 months for 2 years during Fall and Spring. This study was approved by the George Washington University Institutional Review Board.

Participants & Recruitment

Advertisements posted on Facebook and Reddit targeted eligible individuals (18-34 years old, living in one of the 6 MSAs, English speaking) using imagery, taglines, and interests that appeal to young adults. Individuals who clicked on ads were directed to a webpage with a study description and consent form, screened for eligibility, and then administered the baseline survey. Purposive sampling was used to ensure sufficient proportions of the sample represented those using e-cigarettes and cigarettes (roughly 1/3 each), both sexes, and racial/ethnic minorities. Subgroup enrollment was capped by MSA. Participants received an email 7 days after completing the baseline survey asking them to confirm their participation by clicking a "confirm" button included in an email. After confirming,

participants were enrolled and emailed their first incentive (a \$10 e-gift card).

The duration of recruitment ranged from 87 to 104 days across MSAs. Overall, 65,843 Facebook/Reddit users viewed study ads, 10,433 clicked on ads, 9,847 consented, and 7,096 were eligible. Additionally, 2,751 were not allowed to advance to the baseline survey, with 1,427 ineligible and 1,279 not enrolled in order to reach recruitment targets of other demographics. The baseline survey was completed by 3,460 (48.8%; 51.2% partial completes, $n = 3,636$); 3,006 (87%) confirmed participation. The current analyses focused on Fall 2019 data (i.e., one year post baseline; $n = 2,375$, 79.0% response rate; compensation of a \$20 e-gift card). Attrition analyses indicated that participants who did not (vs. did) complete the follow-up survey were younger, more likely male, and more likely to report past-month cannabis use at baseline (Berg et al., 2020).

Measures

Sociodemographic covariates. We coded MSA of residence and whether it was in a state where cannabis retail was legal (California, Massachusetts, Washington) or was not (Georgia, Minnesota, Oklahoma). Other sociodemographics included age, sex, sexual orientation, race, ethnicity, and highest level of educational attainment.

Cannabis use characteristics. Participants were asked to report the number of days used in the past 6 months; those reporting any use were asked to report the number of days used in the past 30 days. Among those who reported any past 6-month use, we asked, "Do you use marijuana for medical or recreational purposes – or both: only for medical purposes, primarily for medical purposes, equally for both, primarily for recreational purposes, only for recreational purposes, I'm not sure." Based on the distributions and limited variability, those reporting only or primarily for medical purposes were collapsed into a single category.

Among those reporting past 6-month use, we also assessed age of first use (to operationalize early onset use; i.e., before age 18), number of times used per day, and whether participants held a medical cannabis card. We also asked participants how they use cannabis most of the

time: smoked (in a joint or bowl, rolled in cigar papers with or without tobacco); vaped (with a vaporizer with or without tobacco); pipe/bong (in a waterpipe or bong with or without tobacco); ingested (with or without food, drank); and other (including tinctures, dabs, etc.; Fong et al., 2006).

We also administered the Cannabis Use Disorder Identification Test – Revised (CUDIT-R), an 8-item scale assessing hazardous use, with scores ranging from 0-32 with higher scores indicating more hazardous use (Adamson et al., 2010). One item from the CUDIT-R that assesses interest in quitting was also used separately (“Have you ever thought about cutting down, or stopping your use of marijuana? never; yes, but not in the past 6 months; or yes, during the past 6 months”). We recategorized participants as considered quitting (or reducing) in the past 6 months vs. others. We also asked, “During the past 30 days, how many times did you ride in a car or other vehicle driven by someone who had been using marijuana? 0, 1, 2-3, 4-5, 6 or more, or prefer not to answer.” This item was categorized as 0 vs. ≥ 1 time.

Other substance use. Participants were asked to report number of days in the past 30 days they used: alcohol, cigarettes, e-cigarettes, little cigars/cigarillos, large cigars, hookah/waterpipe, and smokeless tobacco (NIH, 2020). Alcohol use was used as a continuous variable; use status for each tobacco product was operationalized as any vs. no use in the past 30 days and as a single aggregate variable as any vs. no use of any tobacco product in the past 30 days.

Psychosocial factors. Participants were asked if a parental figure uses/used cannabis (yes/no) and how many of their 5 closest friends use cannabis (Berg et al., 2015). Depressive symptoms were assessed using the Patient Health Questionnaire – 2 item (PHQ-2; Kroenke et al., 2003), which assesses feeling down/depressed and little interest in doing things in the past 2 weeks (0 = not at all to 3 = nearly every day; summed scores of 0-6; Cronbach’s $\alpha = .87$). The ACEs-10 item scale assessed maltreatment and household challenges before age 18 (0 = no, 1 = yes; range 0-10; $\alpha = .81$; Felitti et al., 1998). Finally, participants were asked whether they had ever been diagnosed with ADHD.

Data Analysis

The current study analyzed data from 1,083 participants who reported any cannabis use in the

past 6 months (i.e., since the last assessment). Participant characteristics were summarized using descriptive statistics. Chi-square and one-way ANOVA tests were used to explore differences in participant characteristics in relation to reasons for use.

Then multinomial logistic regression was used to examine correlates of reasons for use, using “equally both” as our referent group. We included other substance use and psychosocial factors, as well as sociodemographic covariates that were significant in bivariate analyses (i.e., age, sex, race/ethnicity, education level). Finally, regression models were used to examine reasons for use in relation to: 1) number of days used (linear regression); 2) CUDIT scores (linear regression); 3) DUIC (binary logistic regression); and 4) recently considering quitting (binary logistic regression). In these models, we accounted for age, sex, race/ethnicity, and education level. Regression analyses were also conducted using multilevel modeling to account for the hierarchical structure of the data (i.e., young adults at the individual level nested within MSA; Aveyard, Markham, & Cheng, 2004; Aveyard, Markham, Lancashire, et al., 2004). However, all intra-class correlations were approximately .01, and findings were not significantly different. All analyses were conducted using SPSS (version 26.0) and alpha set at .05.

RESULTS

Participant Characteristics

In this sample of 1,083 participants who reported past 6-month cannabis use, the average age was 24.46 ($SD = 4.64$), 57.1% lived in states with legalized recreational cannabis, 41.9% were male, 40.3% were sexual minorities, 24.1% were non-White, 12.7% were Hispanic, and 72.9% possessed at least a Bachelor’s degree. In this sample, 37.1% used only for recreational purposes, 23.5% for primarily recreational purposes, 21.5% equally for medical and recreational purposes, and 17.8% for only/primarily medical purposes. Of the 1,083 young adults reporting past 6-month use, 79.3% ($n = 859$) also reported using in the past 30 days (M days of use = 10.59, $SD = 11.38$), and the average CUDIT score was 7.45 ($SD = 5.68$). Overall, 24.3% reported past 30-day DUIC, and

30.9% reported considering past 6-month quit attempts.

Correlates of Reasons for Use

Bivariate analyses (Table 1) indicated that there were differences in the proportions of young adults using cannabis who reported different purposes of use in relation to MSA, age, sex, race, ethnicity, and education level (p 's < .05; see Table 1 for significant post-hoc differences). Regarding cannabis use characteristics, those who used equally for medical and recreational purposes reported the greatest number of days used and times used per day; those using only for recreational purposes reported the least (p 's < .001). Those using only for recreational purposes were also the least likely to report early onset use (p 's < .001) but the most likely to report never trying to quit (p < .001); they also reported the greatest number of days of alcohol use (p = .006). Those using only for medical purposes were most likely to report having a medical cannabis card; those using only recreational were the least likely (p < .001). Those using only for recreational purposes were the least likely to report using via pipe/bong, but were the most likely to report ingesting cannabis as their most common mode of use (p < .001). Those using primarily for recreational purposes were the most likely to report parental use of cannabis and lifetime diagnosis of ADHD (p 's < .001).

Multinomial logistic regression analyses (Table 2) indicated that compared to those who used equally for medical and recreational purposes (referent group), those who reported using for only/primarily medical purposes were less likely to live in Boston, Minneapolis, Seattle, or "other" MSA (vs. Oklahoma City, p 's < .05) and had fewer friends who used cannabis (p = .003). Those who reported using primarily for recreational purposes (vs. equally for medical and recreational purposes) were more likely to live in any other of the MSAs (except Boston) vs. Oklahoma City (p 's < .05), were younger (p < .001), more likely to have at least a bachelor's degree (p = .042), reported fewer ACEs (p = .011), and were less likely to report past-month tobacco use (p <

.001). Those who reported using only for recreational purposes (vs. equally for medical and recreational purposes) were more likely to live in Atlanta, Boston, or Minneapolis (vs. Oklahoma City, p 's < .05), were younger (p < .001), were more likely male (p = .018), had fewer friends who used cannabis (p < .001), reported fewer ACEs (p < .001) and fewer depressive symptoms (p = .008), were less likely to report an ADHD diagnosis (p = .010), used alcohol on more days in the past month (p = .015), and were more likely to report past-month tobacco use (p < .001).

Reasons for Use in Relation to Use Frequency, Dependency, DUIIC and Interest in Quitting

Regression models examining reasons for cannabis use in relation to the number of days used, CUDIT scores, DUIIC, and interest in quitting in the past 6 months among those reporting past 6-month cannabis use are shown in Table 3. Using equally for medical and recreational purposes (vs. all other subgroups of cannabis use) correlated with more days of use, greater CUDIT scores, and greater odds of DUIIC (p 's < .011). Additional correlates included: being male (p = .027) and lower education (p < .001) for days of use; living in any other of the MSAs except Atlanta or Boston (vs. Oklahoma City, p 's < .05), being younger (p = .042), being male (p < .001), and lower education (p < .001) for CUDIT scores; and being male (p < .001) or White (vs. Black; p = .027) for DUIIC. Correlates of considering quitting cannabis included living in San Diego or Seattle (vs. Oklahoma City, p 's < .05), being younger (p < .001), female (p = .002), and using equally for medical and recreational purposes vs. only recreational purposes (p < .001).

DISCUSSION

In this sample of US young adults ages 18-34 reporting past 6-month cannabis use, over one-third (~37%) used only recreationally, while only about one-fifth used primarily recreationally (~23%), equally for both (~21%), and only/primarily medically (~18%).

Table 1. Correlates of reasons for cannabis use among young adults using cannabis within the past 6 months in Fall 2019, N=1,083 *

| Variable | Total | Only/primarily medical | Equally both | Primarily recreational | Only recreational | p |
|--|-------------------|----------------------------|----------------------------|------------------------------|---------------------------|-------|
| | N=1,083 (100%) | N=193 (17.8%) | N=233 (21.5%) | N=255 (23.5%) | N=402 (37.1%) | |
| | N(%) or M(SD) | N(%) or M(SD) | N(%) or M(SD) | N(%) or M(SD) | N(%) or M(SD) | |
| MSA, N(%) | | | | | | <.001 |
| Atlanta | 163 (15.1) | 33 (17.1) | 25 (10.7) | 39 (15.3) | 66 (16.4) | |
| Boston | 227 (21.0) | 32 (16.6) | 46 (19.7) | 51 (20.0) | 98 (24.4) | |
| Minneapolis-St. Paul | 191 (17.6) | 17 (8.8) ^a | 45 (19.3) ^b | 46 (18.0) ^b | 83 (20.6) ^b | |
| Oklahoma City (ref) | 90 (8.3) | 42 (21.8) ^a | 22 (9.4) ^b | 8 (3.1) ^c | 18 (4.5) ^{c,d} | |
| San Diego | 161 (14.9) | 37 (19.2) | 31 (13.3) | 43 (16.9) | 50 (12.4) | |
| Seattle | 213 (19.7) | 25 (13.0) ^a | 53 (22.7) ^{a,b} | 61 (23.9) ^b | 74 (18.4) ^{a,b} | |
| Other | 38 (3.5) | 7 (3.6) | 11 (4.7) | 7 (2.7) | 13 (3.2) | |
| Cannabis retail law, N(%) | | | | | | .155 |
| Legalized | 617 (57.1) | 99 (51.3) | 134 (57.5) | 157 (62.1) | 227 (56.6) | |
| Not legalized | 463 (42.9) | 94 (48.7) | 99 (42.5) | 96 (37.9) | 174 (43.4) | |
| Sociodemographics | | | | | | |
| Age, M(SD) | 24.46 (4.64) | 26.51 (4.82) ^a | 25.35 (4.82) ^b | 23.67 (4.38) ^c | 23.45 (4.18) ^c | <.001 |
| Male, N(%)** | 439 (41.9) | 62 (34.1) ^a | 91 (41.4) ^{a,b} | 96 (38.6) ^{a,b} | 190 (47.9) ^b | .009 |
| Sexual minority, N(%) | 436 (40.3) | 80 (41.5) | 97 (41.6) | 113 (44.3) | 146 (36.3) | .201 |
| Race, N(%) | | | | | | .048 |
| White | 813 (75.1) | 144 (74.6) | 185 (79.4) | 189 (74.1) | 295 (73.4) | |
| Black | 39 (3.6) | 7 (3.6) | 8 (3.4) | 7 (2.7) | 17 (4.2) | |
| Asian | 98 (9.0) | 13 (6.7) ^{a,b} | 9 (3.9) ^b | 28 (11) ^a | 48 (11.9) ^a | |
| Other | 133 (12.3) | 29 (15.0) | 31 (13.3) | 31 (12.2) | 42 (10.4) | |
| Hispanic, N(%) | 138 (12.7) | 26 (13.5) | 34 (14.6) | 32 (12.5) | 46 (11.4) | .699 |
| ≥Bachelor's degree, N(%) | 789 (72.9) | 121 (62.7) ^a | 153 (65.7) ^{a,b} | 195 (76.5) ^{b,c} | 320 (79.6) ^c | <.001 |
| Cannabis use characteristics | | | | | | |
| Number of days used, past 30 days, M(SD) | 10.59 (11.38) | 12.36 (11.88) ^a | 17.15 (11.78) ^b | 11.79 (10.97) ^{a,c} | 5.19 (8.30) ^d | <.001 |
| Early onset use (<18), N(%) | 555 (55.7) | 104 (59.8) ^a | 147 (69.0) ^a | 142 (58.2) ^a | 162 (44.4) ^b | <.001 |
| Times used per day, M(SD) | 2.43 (2.69) | 2.87 (3.21) ^a | 3.90 (3.84) ^b | 2.13 (1.91) ^c | 1.57 (1.31) ^d | <.001 |
| Has medical card, N(%) | 122 (11.7) | 57 (32.6) ^a | 46 (20.5) ^b | 13 (5.2) ^c | 6 (1.5) ^d | <.001 |
| Most common mode of use, N(%) | | | | | | <.001 |
| Smoked | 456 (42.3) | 67 (35.1) | 108 (46.4) | 103 (40.4) | 178 (44.7) | |
| Vaped | 242 (22.5) | 48 (25.1) | 52 (22.3) | 57 (22.4) | 85 (21.4) | |
| Pipe/bong | 173 (16.1) | 34 (17.8) ^a | 47 (20.2) ^a | 57 (22.4) ^a | 35 (8.8) ^b | |
| Ingested | 182 (16.9) | 36 (18.8) ^{a,b} | 20 (8.6) ^c | 35 (13.7) ^{b,c} | 91 (22.9) ^a | |
| Other | 24 (2.2) | 6 (3.1) | 6 (2.6) | 3 (1.2) | 9 (2.3) | |
| CUDIT score, M(SD) | 7.45 (5.68) | 7.33 (5.45) ^a | 10.03 (5.72) ^b | 8.68 (5.73) ^c | 5.24 (4.86) ^d | <.001 |

| | | | | | | |
|---|-------------|---------------------------------|----------------------------------|----------------------------------|----------------------------------|-------|
| Drove under influence, <i>N</i> (%) | 255 (24.3) | 45 (24.3)^a | 95 (43.8)^b | 74 (29.7)^a | 41 (10.3)^c | <.001 |
| Considered cutting down or quitting, past 6 months, <i>N</i> (%) | | | | | | <.001 |
| Never | 559 (53.2) | 99 (52.7)^a | 100 (44.6)^{a,b} | 97 (38.8)^b | 263 (67.6)^c | |
| Yes, but not in the past 6 months | 167 (15.9) | 45 (23.9)^a | 40 (17.9)^a | 45 (18.0)^a | 37 (9.5)^b | |
| Yes, in the past 6 months | 325 (30.9) | 44 (23.4)^a | 84 (37.5)^b | 108 (43.2)^b | 89 (22.9)^a | |
| Other substance use | | | | | | |
| Number of days of alcohol use, past 30 days, <i>M</i> (<i>SD</i>) | 6.83 (6.54) | 5.60 (6.72)^a | 6.65 (7.03)^{a,b} | 6.72 (6.13)^{a,b} | 7.59 (6.33)^b | .006 |
| Past-month tobacco use, <i>N</i> (%) | | | | | | |
| Cigarettes | 363 (33.5) | 80 (41.5)^{a,b} | 106 (45.5)^b | 79 (31.0)^{a,c} | 98 (24.4)^c | <.001 |
| E-cigarettes | 506 (46.7) | 110 (57.0)^{a,b} | 138 (59.2)^b | 114 (44.7)^{a,c} | 144 (35.8)^c | <.001 |
| Little cigars/cigarillos | 152 (14.0) | 44 (22.8)^a | 48 (20.6)^a | 42 (16.5)^a | 18 (4.5)^b | <.001 |
| Large cigars | 98 (9.0) | 25 (13.0) | 24 (10.3) | 16 (6.3) | 33 (8.2) | .080 |
| Hookah | 125 (11.5) | 31 (16.1) | 26 (11.2) | 32 (12.5) | 36 (9.0) | .079 |
| Smokeless tobacco | 40 (3.7) | 10 (5.2) | 12 (5.2) | 7 (2.7) | 11 (2.7) | .234 |
| Any tobacco | 664 (61.3) | 136 (70.5)^a | 175 (75.1)^a | 147 (57.6)^b | 206 (51.2)^b | <.001 |
| Psychosocial factors | | | | | | |
| Parental use of cannabis, <i>N</i> (%) | 264 (24.4) | 60 (31.1)^a | 72 (30.9)^a | 74 (29.0)^a | 58 (14.4)^b | <.001 |
| Number of friends using cannabis, <i>M</i> (<i>SD</i>) | 3.20 (1.49) | 3.06 (1.58)^a | 3.60 (1.41)^b | 3.46 (1.34)^{b,c} | 2.86 (1.49)^{a,d} | <.001 |
| Depressive symptoms, <i>M</i> (<i>SD</i>) | 1.78 (1.74) | 1.96 (1.85)^a | 2.15 (1.98)^a | 1.92 (1.65)^a | 1.40 (1.50)^b | <.001 |
| ACEs, <i>M</i> (<i>SD</i>) | 2.50 (2.48) | 3.60 (2.77)^a | 3.24 (2.53)^a | 2.37 (2.34)^b | 1.62 (2.01)^c | <.001 |
| Lifetime diagnosis of ADHD, <i>N</i> (%) | 144 (13.3) | 30 (15.5)^a | 39 (16.7)^a | 43 (16.9)^a | 32 (8.0)^b | .001 |

Note. *p*-values indicate omnibus tests (per ANOVA and Chi-Square) across modes of use. Bolded and italicized values indicate statistical significance at *p* < .05. Different superscripts denote statistically significant differences between groups at *p* < .05. * Excluding those who report “not sure” for purpose of use (*N* = 15). ** 87 reported “other” sex.

Table 2. Multinomial logistic regression examining correlates of reasons for cannabis use among young adults using cannabis in the past 6 months (referent: use cannabis equally for medical and recreational purposes) *

| Variable | Only or primarily medical | | | Primarily recreational | | | Only recreational | | |
|--|---------------------------|-----------|----------|------------------------|-----------|----------|-------------------|-----------|----------|
| | aOR | CI | <i>p</i> | aOR | CI | <i>p</i> | aOR | CI | <i>p</i> |
| MSA (ref: Oklahoma City) | | | | | | | | | |
| Atlanta | 0.73 | 0.34-1.60 | .435 | 3.35 | 1.23-9.07 | .018 | 2.64 | 1.11-6.24 | .027 |
| Boston | 0.39 | 0.19-0.81 | .012 | 2.58 | 1.00-6.63 | .050 | 2.50 | 1.12-5.58 | .025 |
| Minneapolis | 0.22 | 0.10-0.50 | <.001 | 2.63 | 1.02-6.81 | .046 | 2.31 | 1.02-5.21 | .044 |
| San Diego | 0.70 | 0.33-1.48 | .346 | 3.43 | 1.29-9.16 | .014 | 1.69 | 0.71-4.02 | .233 |
| Seattle | 0.24 | 0.11-0.51 | <.001 | 3.12 | 1.23-7.95 | .017 | 1.92 | 0.85-4.30 | .115 |
| Other | 0.29 | 0.09-0.98 | .046 | 1.43 | 0.39-5.23 | .587 | 1.14 | 0.36-3.61 | .824 |
| Sociodemographics | | | | | | | | | |
| Age | 1.04 | 0.99-1.09 | .057 | 0.90 | 0.87-0.94 | <.001 | 0.88 | 0.84-0.91 | <.001 |
| Female (ref: male)** | 1.48 | 0.95-2.31 | .081 | 1.00 | 0.67-1.50 | .995 | 0.63 | 0.43-0.92 | .018 |
| Race (ref: White) | | | | | | | | | |
| Black | 0.97 | 0.31-2.99 | .955 | 1.15 | 0.36-3.70 | .812 | 2.04 | 0.75-5.59 | .164 |
| Asian | 2.21 | 0.87-5.61 | .097 | 2.15 | 0.95-4.89 | .067 | 2.07 | 0.93-4.58 | .074 |
| Another race | 1.13 | 0.61-2.09 | .710 | 1.01 | 0.56-1.81 | .976 | 0.90 | 0.50-1.60 | .715 |
| Hispanic (ref: non-Hispanic) | 0.87 | 0.47-1.63 | .670 | 0.82 | 0.46-1.48 | .512 | 0.90 | 0.51-1.60 | .721 |
| ≥Bachelor’s degree (ref: <Bachelor’s degree) | 0.81 | 0.51-1.29 | .370 | 1.60 | 1.02-2.53 | .042 | 1.43 | 0.92-2.22 | .116 |
| Other substance use | | | | | | | | | |
| Number of days of alcohol use | 0.99 | 0.96-1.03 | .674 | 1.01 | 0.98-1.04 | .643 | 1.04 | 1.01-1.07 | .015 |
| Any past 30-day tobacco use (ref: no) | 0.97 | 0.60-1.57 | .909 | 0.47 | 0.31-0.72 | <.001 | 0.36 | 0.24-0.54 | <.001 |
| Psychosocial factors | | | | | | | | | |
| Parental cannabis use (ref: no) | 1.09 | 0.69-1.73 | .720 | 1.19 | 0.77-1.83 | .436 | 0.57 | 0.36-0.89 | .014 |
| Number of friends using cannabis | 0.81 | 0.70-0.93 | .003 | 0.92 | 0.80-1.06 | .234 | 0.72 | 0.63-0.82 | <.001 |
| ACEs | 1.08 | 0.99-1.18 | .078 | 0.90 | 0.82-0.98 | .011 | 0.83 | 0.76-0.91 | <.001 |
| Depressive symptoms | 0.94 | 0.83-1.05 | .268 | 1.00 | 0.90-1.12 | .989 | 0.86 | 0.76-0.96 | .008 |
| ADHD (ref: no) | 1.06 | 0.60-1.87 | .855 | 1.13 | 0.67-1.90 | .656 | 0.47 | 0.27-0.84 | .010 |
| Nagelkerke R² | .349 | | | | | | | | |

Note. Italicized values indicate statistical significance at *p* < .05. * Excluding those who report “other” most frequent modes of use, *N* = 19. ** 87 reported “other” sex.

Table 3. Regression models examining reason(s) for use in relation to number of days used, CUDIT scores, driving under the influence of cannabis (DUIC), and considered cutting down or quitting in the past 6 months among young adults using cannabis in the past 6 months *

| Variable | Days of use | | | CUDIT | | | DUIC | | | Considered cutting down/quitting | | |
|--|-------------------|----------------|----------|-------------------|---------------|----------|-------------------|-----------|----------|----------------------------------|-----------|----------|
| | B | CI | <i>p</i> | B | CI | <i>p</i> | aOR | CI | <i>p</i> | aOI | CI | <i>p</i> |
| MSA (ref: Oklahoma City) | | | | | | | | | | | | |
| Atlanta | -2.40 | -5.16-0.36 | .088 | 0.71 | -0.70-2.13 | .322 | 1.05 | 0.53-2.07 | .886 | 1.92 | 0.99-3.73 | .054 |
| Boston | 0.60 | -2.02-3.23 | .652 | 1.31 | -0.04-2.65 | .058 | 1.25 | 0.66-2.36 | .495 | 1.19 | 0.62-2.28 | .603 |
| Minneapolis | 0.90 | -1.82-3.62 | .515 | 1.43 | 0.03-2.83 | .045 | 1.23 | 0.63-2.38 | .549 | 1.63 | 0.84-3.13 | .146 |
| San Diego | 0.19 | -2.58-2.95 | .895 | 1.56 | 0.15-2.98 | .031 | 1.13 | 0.58-2.20 | .731 | 2.11 | 1.15-4.28 | .018 |
| Seattle | 2.46 | -0.20-5.11 | .070 | 2.71 | 1.34-4.07 | <.001 | 1.00 | 0.52-1.91 | .993 | 2.35 | 1.24-4.45 | .009 |
| Other | -0.32 | -4.34-3.71 | .877 | 1.67 | -0.40-3.74 | .113 | 0.77 | 0.28-2.17 | .624 | 1.58 | 0.61-4.06 | .344 |
| Sociodemographics | | | | | | | | | | | | |
| Age | 0.07 | -0.08-0.21 | .361 | -0.08 | -0.15- -0.00 | .042 | 0.99 | 0.96-1.03 | .746 | 0.92 | 0.89-0.95 | <.001 |
| Female (ref: male)** | -1.44 | -2.71 - -0.16 | .027 | -1.53 | -2.18 - -0.88 | <.001 | 0.45 | 0.33-0.62 | <.001 | 0.63 | 0.48-0.84 | .002 |
| Race (ref: White) | | | | | | | | | | | | |
| Black | 1.92 | -1.48-5.33 | .268 | 1.04 | -0.71-2.79 | .243 | 2.41 | 1.11-5.27 | .027 | 1.23 | 0.55-2.71 | .616 |
| Asian | -1.09 | -3.30-1.12 | .334 | -0.33 | -1.47-0.81 | .571 | 0.87 | 0.48-1.59 | .653 | 0.91 | 0.56-1.37 | .715 |
| Another race | 1.06 | -0.91-3.03 | .292 | -0.38 | -1.39-0.64 | .466 | 1.09 | 0.67-1.76 | .739 | 0.88 | 0.56-1.37 | .570 |
| Hispanic (ref: non-Hispanic) | -0.26 | -2.23-1.72 | .799 | 0.95 | -0.07-1.96 | .067 | 0.94 | 0.58-1.52 | .797 | 0.88 | 0.57-1.37 | .571 |
| ≥Bachelor's degree (ref: <Bachelor's degree) | -3.44 | -4.90 - -1.99 | <.001 | -1.78 | -2.53 - -1.02 | <.001 | 0.76 | 0.54-1.08 | .123 | 1.12 | 0.81-1.55 | .498 |
| Reason(s) for use (ref: equally) | | | | | | | | | | | | |
| Primarily or only medical | -4.81 | -6.87 - -2.76 | <.001 | -2.09 | -3.14 - -1.03 | <.001 | 0.44 | 0.28-0.70 | <.001 | 0.66 | 0.41-1.04 | .073 |
| Primarily recreational | -4.82 | -6.71 - -2.93 | <.001 | -1.26 | -2.23 - -0.28 | .011 | 0.54 | 0.36-0.82 | .003 | 1.06 | 0.72-1.58 | .759 |
| Only recreational | -11.22 | -12.96 - -9.48 | <.001 | -4.67 | -5.57 - -3.78 | <.001 | 0.13 | 0.08-0.20 | <.001 | 0.40 | 0.27-0.60 | <.001 |
| R-square | .195 ^a | | | .161 ^a | | | .176 ^b | | | .169 ^b | | |

Note. Italicized values indicate statistical significance at *p* < .05. * Excluding those who report “not sure” for purpose of use (N=15). ** 87 reported “other” sex. ^a Adjusted R-square; ^b Nagelkerke R-square.

The rate of any current use for medical purposes was higher than the rate of ever use for medical purposes among US and Canadian adults from a 2018 study (27%) (Leung et al., 2022), which likely reflects the continued evolving sociopolitical context of cannabis and the younger age range of the current sample (who are more likely to use for medical purposes; Leung et al., 2022). One notable finding is that a sizable proportion of young adults reported using cannabis for both medical and recreational purposes, which is an important contribution to the literature given that most studies on cannabis use have disregarded the potentially important differences across these distinct segments of young adults who use only recreationally, primarily recreationally, only/primarily medically, or equally for both. Consistent with prior literature (Johnson et al., 2016; Kumar et al., 2019; Swan et al., 2021), the largest portion of participants reported their most common mode of cannabis use as smoked, followed by vaped relative to using via pipe/bong or edibles. Moreover, a larger proportion of those who reported using recreationally only vs. other reasons for use reported most commonly ingesting cannabis, whereas a smaller portion reported most commonly using cannabis via pipe or bong, also consistent with some prior work (Azcarate et al., 2020).

Other novel findings in this study suggest that using cannabis equally for medical and recreational purposes was associated with various mental health risks. For example, those using equally for medical and recreational purposes reported more ACEs and depressive symptoms, as well as greater likelihood of an ADHD diagnosis and past-month tobacco and alcohol use, compared to those using only (or primarily) recreationally. Furthermore, using equally for medical and recreational purposes (vs. all other subgroups of cannabis use) was associated with more days of use, greater CUDIT scores, and DUIC. These findings underscore concerns for those who use cannabis equally for both purposes and may explain mixed findings documented in the literature: some research has found that individuals who use cannabis for medical (vs. recreational) purposes may use more frequently (Lin et al., 2016) and be more likely to DUIC (Wickens et al., 2022); other research suggests medical use is associated with lower rates of

problematic cannabis use (Connor et al., 2021). Specifically, these mixed findings may be partially attributable to assessments of reasons for use that do not account for the possibility of using equally for both medical and recreational purposes.

Interestingly, using equally for medical and recreational purposes vs. only recreational purposes was associated with having considered quitting cannabis in the past 6 months, which could be an indicator of potential positive outcomes in the future (i.e., potentially quitting or reducing). However, this item is also conceptualized as a marker of dependency in the CUDIT (Adamson et al., 2010). Thus, the implications of this finding are difficult to interpret and may require longitudinal research to determine if quit intentions in fact do predict quitting or in what use subgroups it may predict quitting.

With regard to other findings, using only/primarily medically or only recreationally was associated with having fewer friends who used cannabis, compared to using equally for medical and recreational purposes, which might relate to the significant role that social influences play in one's use and motives for use (Denson et al., 2023). In terms of sociodemographic findings, in this sample of young adults, younger age was associated with using primarily or only recreationally (vs. equally for medical and recreational purposes), which may align with prior findings that adults in the 26-35 age range are most likely to have used for medical purposes (Leung et al., 2022). Other novel findings were that, compared to using equally for medical and recreational purposes, using primarily recreationally was associated with higher education, and using only recreationally was associated with being male. Reporting more markers of problematic use (e.g., greater days of use, CUDIT scores, DUIC) was also associated with being younger, being male, or lower education (Azofeifa et al., 2019; Carliner et al., 2017). Those who were younger and female were more likely to have considered quitting cannabis, findings not previously documented in relation to cannabis but shown to be associated with intentions to quit tobacco (Henley et al., 2016; Silfen et al., 2015); these findings warrant additional investigation.

Current findings have implications for research and practice. First, more detailed

assessments of cannabis use motives and related factors are needed to better understand how and why young adults use cannabis and to identify potentially high-risk profiles of use. Given current findings that those who use equally for medical and recreational purposes reported more negative mental health indicators (e.g., ACEs, depressive symptoms) and markers of problematic use (e.g., dependence, DUIC), it is crucial to understand how these individuals interpret and distinguish medical and recreational use and for what medical purposes they use cannabis. Furthermore, these results suggest that interventions to reduce cannabis use and related negative consequences among young adults should be tailored to the specific reasons for use, as different subgroups of young adults using cannabis may have different needs, engage in distinct risk behaviors, and require different strategies to alter their behaviors. Finally, practitioners, especially those working with young adult populations, should not only assess cannabis use among those they serve, but also assess why they use, how they distinguish medical vs. recreational use, and any high-risk outcomes, like signs of dependency or DUIC.

Limitations

This study is limited in generalizability to other young adults in the included MSAs or across the US, given the purposive sampling design to recruit targeted proportions of young adults using e-cigarettes and cigarettes and racial and ethnic minority groups, the use of social media-based recruitment, and the focus on 6 MSAs. Relatedly, rates of tobacco and cannabis use should not be interpreted as use prevalence rates. In addition, the cross-sectional nature of these analyses and the use of self-report assessments limits our ability to infer causation and introduces the possibility of biased reporting. Future research should use longitudinal data to better understand the directionality of associations between sociodemographics, psychosocial factors, and other substance use with reasons for cannabis use and associations between reasons for use with problematic cannabis use outcomes.

Conclusions

Current findings suggest that using equally for medical and recreational purposes, relative to

the other cannabis use profiles, was associated with greater mental health concerns (e.g., ACEs, other substance use) and problematic use outcomes (e.g., use frequency, dependency symptoms, DUIC). Moreover, this study documented a substantial proportion of young adults who report various profiles of purposes for using cannabis (e.g., only recreationally, primarily medically, equally for both). Taken together, these findings underscore the importance of understanding these use profiles and how young adults interpret and distinguish medical and recreational use.

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