Cannabis Use Patterns and Co-Use of Alcohol and Nicotine in Adults Over 50 by Demographic Factors and Medical Cannabis Use

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ABSTRACT

Objective: Cannabis use among adults over age 50 is increasing, but data on specific products, co-use, and cannabis-related problems in this age group are lacking. The current study assessed differences in cannabis use patterns and alcohol and nicotine co-use by select demographic factors and medical cannabis status, as well as associations with problem cannabis use, among adults over 50. **Method:** Adults over age 50 who used cannabis use in the past 30 days were recruited from a healthcare system and invited to complete an online survey. **Results:** Participants ($N = 367$) were 43% female, with an average age of 65.9 ($SD = 8.6$), and predominantly White (67.9%), Native Hawaiian or Pacific Islander (NHPI; 12.3%), or Asian (9.3%). Mean frequency of cannabis use within the past 30 days was 18.7 days ($SD = 11.5$), and 27% reported use of non-medical cannabis-only. Co-use of cannabis with other substances was common, especially alcohol. Although group comparisons showed several differences by age, sex, and medical cannabis status, greater differences were found by race/ethnicity. White participants were more likely than others to have a state medical cannabis card, source their cannabis solely from medical dispensaries, and report alcohol co-use. NHPI participants were most likely to smoke cannabis and use tobacco. Smoking, as compared to consuming edibles and "other" methods, and greater cannabis frequency, were associated with problem cannabis use. **Conclusions:** Findings illustrate patterns of cannabis and other substance use, with important demographic differences. Future research among older adults should include development of targeted interventions to address cannabis use problems and polysubstance use.

Key words: = cannabis; older adults; Native Hawaiian and Pacific Islanders; Asian; race; problem cannabis use; cannabis use disorder

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As cannabis becomes legalized for medical and non-medical (recreational) purposes, prevalence among adults over age 50 has increased. Recent estimates suggest that up to 15% of adults over 50 report past-year cannabis use, and approximately 6-11% have used it in the past month, with higher rates in those aged 50-64 compared to those over the age of 65 (Fernandez et al., 2023; Han & Palamar, 2018, 2020; Kepner et al., 2023; Patrick et al., 2022; Salas-Wright et al., 2017). Public opinion surrounding cannabis has become more permissive in the U.S. over time, coinciding with changes in state cannabis policies and cultural norms surrounding use (Carliner et al., 2017). Perceptions of risk related to cannabis are also changing among older adults. A recent study with a national sample of adults age 65 and older showed that perceived risk associated with regular cannabis use decreased from 53% to 43% from 2015 to 2019 (Han et al., 2021).

The changing landscape of cannabis acceptance has been accompanied by a transformation in consumption methods. A growing body of evidence finds that cannabis, and particular ways of consuming it, are linked to potential health risks (Fischer et al., 2022). Smoking cannabis remains the most common method of ingestion across all age groups and can lead to respiratory issues, such as chronic bronchitis and lung irritation (Fischer et al., 2022; Leal & Moscrop-Blake, 2024; Russell et al., 2018). Vaping cannabis oil, flower, or high-potency products in aerosol form, which allows for greater discretion, has grown in popularity and is often viewed as a safer alternative to smoking (Aston et al., 2019). Although health outcomes related to vaping remain unclear, vaping cannabis has been linked to E-cigarette or Vaping Product Use-Associated Lung Injury (EVALI), often caused by additives like vitamin E acetate (Cherian et al., 2020). Use of high-potency THC and dabbing, or inhaling concentrated cannabis extracts, can increase the risk of cannabis use disorder (CUD) and psychiatric effects, such as psychosis (Arterberry et al., 2019; Hoch et al., 2025). Lastly, cannabis edibles (e.g., cookies, candies), while thought to be the most benign of the consumption methods, can result in unintentional overconsumption due to their slower effects, especially in those with less tolerance to cannabis (Hoch et al., 2025; Russell et al., 2018).

Little is known about cannabis product use, patterns, co-use, and CUD among older adults. Past work suggests that middle-aged and older U.S. adults are more likely than younger adults to consume cannabis using one method vs. multiple methods, mostly consume cannabis via smoking, and are less likely to consume cannabis concentrates or vape (Livne et al., 2024). A study of adults in Washington state found that smoking and oral consumption were the most common methods of cannabis ingestion among participants over age 50 (Subbaraman & Kerr, 2021). One-third to half of participants over age 50 reported usually or always using cannabis with alcohol. Another study found that older adults who reported past year alcohol use were more likely to endorse cannabis use in the past year, with increasing odds of cannabis use as level of alcohol-related harm increased (Fernandez et al., 2024). A study examining electronic health records of adults over age 50 found that patients who had cannabis noted in their medical record had a greater risk of alcohol or tobacco use disorder compared to matched controls (Phillips et al., 2024). Further evidence on patterns of cannabis use and co-use in older adults would be useful to understand potential cannabis-related health risks in the aging population.

Given the physiological and cognitive changes associated with aging, adults over age 50 may be at higher risk of cannabis-related adverse health effects. Older adults are more prone to a wide range of health conditions, including cardiovascular events and diseases (e.g., hypertension, myocardial infarction), respiratory illnesses (e.g., chronic obstructive pulmonary disorder [COPD]), and injuries/falls (Centers for Disease Control and Prevention, 2020; Kochanek et al., 2023). A growing body of evidence has linked cannabis use with declines in respiratory function, chronic bronchitis, gastrointestinal problems (e.g., cannabinoid hyperemesis syndrome), motor vehicle crashes, and risk for certain mental health disorders (e.g., schizophrenia; Gracie & Hancox, 2021; National Academies of Sciences and Medicine [NASEM], 2017; Phillips et al., 2022; Tan et al., 2019; Wolfe et al., 2023). However, there is a significant gap in research assessing cannabis-related health outcomes in older adults (Wolfe et al. 2023). Co-use of cannabis with alcohol and nicotine further complicate the examination of cannabis-related

health effects due to overlapping and interacting influences on health outcomes. The prevalence of alcohol use and binge drinking among older adults is a growing concern (White et al., 2023). Low-risk drinking has been shown to be associated with higher mortality in older adults who have underlying health conditions or socioeconomic risk factors (Ortolá et al., 2024). As the frequency and amount of alcohol increases, additional risks for cancer and cardiovascular disease also rise (Ortolá et al., 2024). Although smoking cigarettes has declined in all age groups, including older adults, smoking can exacerbate age-related health challenges and increase the likelihood of severe health outcomes, including mortality, cancer, dementia, and cardiovascular disease (Gellert et al., 2012; Hunt et al., 2023). With younger populations, there is evidence that the combined effects of cannabis and tobacco smoking or vaping contribute to a higher risk profile, particularly with a lengthier smoking history (Meier & Hatsukami, 2016; Smith et al., 2020; Winhusen et al., 2019), but few studies have examined health impacts of cannabis and nicotine or alcohol co-use (or poly-substance use of all three) in older adults. It is not clear whether using multiple substances significantly elevates health risks for older adults above and beyond single-substance use, particularly in those with pre-existing health conditions.

While cannabis has demonstrated adverse health effects, it may also provide therapeutic benefits. According to the National Academies of Sciences & Medicine (NASEM, 2017), there is conclusive or substantial evidence that cannabis or cannabinoids are effective in treating chronic pain, chemotherapy-induced nausea and vomiting, and patient-reported spasticity associated with multiple sclerosis. There is moderate evidence that cannabis can improve sleep associated with specific health conditions (e.g., sleep apnea). However, evidence for other conditions remains limited or insufficient. Surveys with older adults using cannabis medically (Brown et al., 2020; Manning & Bouchard, 2021; Reinarman et al., 2011) and medically/non-medically (Lum et al., 2019) suggest that many use cannabis to treat chronic pain, anxiety, depression, insomnia, nausea, and arthritis, with respondents reporting improved outcomes. Despite the limited evidence of therapeutic benefit, a wide range of medical and

behavioral health diagnoses qualify the general public for state-approved medical cannabis programs (Boehnke et al., 2019). Furthermore, most studies assessing medical benefits have not addressed safety and efficacy in older adults (NASEM, 2017; Wang et al., 2023). This is an important limitation as specific cannabis products, administration methods, and doses may affect older adults differently (Levy et al., 2020).

This paper aims to address some of these knowledge gaps by examining cannabis use for medical and non-medical purposes among a diverse sample of adults over 50, including cannabis use patterns (frequency, forms used, methods of ingestion, medical vs. non-medical use, and access to/use of medical dispensaries) and co-use of cannabis with nicotine and alcohol. Additionally, we compare differences in cannabis use patterns by medical vs. non-medical cannabis status, age (50-64 vs. 65 and older), sex assigned at birth, and race/ethnicity, and assess factors associated with cannabis use problems. All data were collected in one state (Hawai'i) with a diverse population and legal medical cannabis use since 2000 (no current state-approved non-medical use). As data were primarily exploratory and the literature on cannabis use in older adults remains limited, there were no a priori hypotheses.

METHODS

Participants and Procedures

Participants were recruited from Kaiser Permanente Hawaii, a large, not-for-profit integrated healthcare provider with services across Hawai'i and a socioeconomically diverse membership. Electronic health records were used to identify adults over 50. Recruitment emails were sent to a total of 18,000 older adults, inviting those who used cannabis in the past 30 days to participate in the survey. In addition to the initial email, one reminder email was sent to non-responders. Participant eligibility included age over 50, use of any type of cannabis (including medical/non-medical; cannabidiol [CBD] or tetrahydrocannabinol [THC]) in the past month, and state of Hawai'i residency. REDCap was used to administer a brief online screener to identify eligibility. This was followed by informed consent and the "CannabisOver50" survey for eligible and

interested participants. Of the 18,000 individuals who were sent recruitment materials, 650 clicked on the eligibility survey; 422 completed the eligibility items and were eligible to participate. The remaining 228 were either not eligible ($n = 202$) or did not answer any or all of the eligibility items ($n = 26$). Of those who screened as eligible, 367 completed the survey. The survey took approximately 30 minutes and participants were compensated with a $10 gift card to a local grocery store. Although participation was not anonymous (we collected contact information to send compensation), participant survey responses were not linked to names and medical record numbers to promote confidentiality. The Kaiser Permanente Southern California-Hawaii Institutional Review Board (IRB) approved all procedures.

Measures

Sociodemographic characteristics. Participants were asked to report their sex assigned at birth, gender identification, age, work status, race/ethnicity, and island of residence. As is common with Hawaiian samples (Kaneshiro et al., 2011), participants who reported any Native Hawaiian ancestry were classified as Native Hawaiian to reflect the unique culture and indigenous status.

Daily Sessions, Frequency, Age of Onset, and Quantity of Cannabis Use Inventory (DFAQ-CU; Cuttler & Spradlin, 2017). A modified and abbreviated version of the DFAQ-CU was used to assess frequency of cannabis use (days used in the past 30 days), primary method of ingestion (smoke, vape, eat edibles, and "other methods" such as skin application and dabbing), and primary form of cannabis used (flower, edibles, concentrates, skin products, vapes, other). Responses for the primary form of cannabis were revised based on the cannabinoid type used (THC, CBD, or THC-CBD blend).

Cannabis Use Disorders Identification Test-Revised (CUDIT-R; Adamson et al., 2010). The psychometrically-validated CUDIT-R includes eight items that examine hazardous or problem cannabis use. Each item is scored from $0 – 4$, and total scores range from $0 – 32$. As suggested for screening community-based participants, we provide descriptive data related to a cut-off score of ≥9 to indicate problem cannabis use (Coelho et al., 2024).

Medical and non-medical cannabis use. Participants were asked to self-report if their cannabis use was medical-only, non-medical-only, or both. If they reported any medical use, they were asked if they had a current State of Hawaiʻi medical cannabis card. All participants were asked where they sourced their cannabis from, and a separate variable assessed solely sourcing cannabis from a medical dispensary.

Alcohol and nicotine use. Participants were asked if they had consumed any alcohol in the past three months. Those who reported any alcohol use were asked about the frequency of their alcohol use in the past 30 days. Participants were also asked whether they currently used nicotine products (including cigarettes and e-cigarettes). Co-use was defined as past month use of cannabis and alcohol -or- past month use of cannabis and nicotine. Poly-substance use was defined as use of all three substances in the past month. Simultaneous use (i.e., use that occurs at approximately the same time) was not assessed.

Data Analyses

Sample characteristics were examined using descriptive statistics. Comparisons of cannabis use characteristics between groups (age, sex at birth, race, and any medical cannabis use) were evaluated using t-tests, one-way ANOVA, chi-square, and Fisher's exact tests as appropriate. We treated the CUDIT-R both continuously and categorically (cutoff score of ≥9 vs <9) for descriptive purposes and group comparisons. In a model examining factors associated with problem cannabis use, continuous CUDIT-R score was used as the outcome. Demographic characteristics, cannabis use and co-use patterns, and purpose of cannabis use (medical/non-medical), as well as pairwise interaction terms, were all considered in the multiple linear regression model. Only those variables reaching significance at $p < .05$ were retained in the final model. We report parameter estimates (and SEs) for the independent relationship between each regressor with total CUDIT-R score. All analyses used SAS 9.4 (SAS Institute). As respondents were not required to answer every question, missing data varied for each comparison. Thus, reported *p*-values are based on complete case analyses. Sensitivity analyses with missing

values included as a separate category yielded similar results.

RESULTS

Sample Characteristics

As shown in Table 1, over half of the participants (55.6%) endorsed male sex assigned at birth. Participants endorsed identifying as a man (54.8%), woman (42.5%), or transgender, non-conforming, or another gender (2.7%). Average age was 65.9 (*SD* = 8.6) years, ranging from 50 – 99 years old. Participants lived on five of the six major Hawaiian islands, with the majority living on Oʻahu (49.2%) and the Big Island of Hawaiʻi (30.8%), representing a mix of urban, suburban, and rural communities. Over half of participants (54.8%) reported being retired or not working, while 27% were working full-time. Most participants self-identified as White (67.9%), followed by Native Hawaiian and Pacific Islander (NHPI; 12.3%), Asian (9.3%), Multiracial (6.8%), and Unknown (3.8%).

Cannabis Use Patterns and Co-Use With Other Substances

The largest proportion of participants (47.8%; *n* = 151) endorsed using cannabis both medically and non-medically, while 25% (*n* = 79) reported medical use only, and 27.2% (*n* = 86) endorsed only non-medical use. Of those reporting any medical use (*n* = 230), 114 (50%) reported having a state-approved medical cannabis card. Of the full sample of 367 participants, over one-fourth (*n* = 93) reported solely obtaining their cannabis through a medical dispensary.

Although participants reported consuming a range of cannabis products, the majority (59.9%) reported that THC-based (i.e., THC or THC/CBD) flower was the primary form they used. Other THC products used included edibles (16.7%), vapes (6.3%), concentrates (2.9%), and skin products (2%). A small subset endorsed CBD-only products (6.3%). Most participants (56.7%) reported smoking, followed by oral consumption (22%), vaping (11.9%), skin application (6.1%), or dabbing (1.2%). Mean days of cannabis use in the past 30 days was 18.7 (*SD* = 11.5). Over 30% of participants scored above the cut-off score for problem cannabis use on the CUDIT-R.

Of the full sample, 71.7% reported drinking alcohol in the past three months. Almost 10% of the sample endorsed current nicotine use. In looking at combinations of co-use, 29.9% of participants reported sole use of cannabis and no other substances in the past month, 3.7% reported using cannabis and nicotine, 5.6% reported cannabis, nicotine, and alcohol use, and 60.9% endorsed cannabis and alcohol use.

Differences in Cannabis and Co-Use Patterns by Participant Demographics and Medical/Non-Medical Use

We compared participants by age (50-64 vs. 65+), sex assigned at birth (female vs male), race/ethnicity, and medical (i.e., "any self-reported medical use") vs. non-medical use on the following variables: frequency of cannabis use (days out of the past 30), primary form of cannabis used, primary method of cannabis ingestion, problem use (CUDIT-R-total score and CUDIT-R score ≥9), having a state medical cannabis card, sourcing cannabis from a medical dispensary, frequency of alcohol use (days out of past 30), current nicotine use, and co-use of multiple substances. Group comparisons can be found in Table 2.

Age. Few differences emerged by age. Adults over age 65 reported a greater number of days of alcohol use in the past month (*M* = 7.8, *SD* = 10) compared to adults ages 50-64 (*M* = 5.9, *SD* = 8.1; *p* = .04). Other variables did not differ significantly.

Sex assigned at birth. Male participants were more likely to smoke cannabis, and females were more likely to use other ingestion methods (apply oils/creams, dab rig, other); vaping and edible use were similar (*p* = .01). Males had higher problem cannabis use scores (CUDIT-R 7.9 vs 6.7, *p* = .01) and were more likely to score above the cut-off score of 9 on the CUDIT-R (37.3% vs 21.3%, *p* = .001).

Race/ethnicity. When stratified by race/ethnicity, the number of days of cannabis use differed significantly, with White and Multiracial participants using more frequently than Asian and NHPI participants (*p* = .004). NHPIs were more likely than other racial/ethnic groups to report use of THC flower (77.5%) as their primary form of cannabis and smoking as their primary method of ingestion (82.5%). Asian participants

were more likely than other groups to use CBD-only products. Non-White participants were less likely than White participants to have a state medical cannabis card ($p = .03$) or to obtain their cannabis solely through a medical dispensary ($p = .02$). Co-use of cannabis with alcohol and/or nicotine also differed by race/ethnicity, with greater numbers of NHPI participants endorsing nicotine use (19%) compared to other groups ($p = .02$), and White and Multiracial participants reporting more frequent alcohol use compared to Asians and NHPIs ($p < .001$). When examining different combinations of co-use, several trends were noted despite cell size limitations. Multiracial participants were most likely to use cannabis solely, White participants were most likely to co-use cannabis and alcohol, and NHPIs were most likely to engage in poly-substance use (cannabis, alcohol, and nicotine use).

Medical vs. non-medical use. Participants who endorsed any medical cannabis use reported more frequent use (20.9 vs. 13.7 days, $p < .001$) and were more likely to use a medical dispensary as their only source of cannabis compared to those using non-medically (33.5% vs. 10%, $p < .001$). Participants using cannabis non-medically were more likely to smoke cannabis compared to those using medically (68.2% vs 54.8%, $p = .02$).

Factors associated with cannabis-related problems. We first assessed whether age, cannabis use frequency (days in past 30), alcohol use frequency (days in past 30), nicotine use, race/ethnicity, medical/non-medical cannabis use, form of cannabis used, and method of cannabis ingestion were significantly associated with problem cannabis use (as assessed by total CUDIT-R score) in simple regression models. Any variable that was significantly associated with problem use at $p < .05$ (i.e., sex, cannabis use frequency, form of cannabis used, and method of cannabis ingestion) was evaluated in the multiple linear regression model (Table 3). Method of ingestion (i.e., smoking cannabis as compared to consuming edibles and using "other methods"; ß = -2.55, $p < .001$ and ß = -2.62, $p = .02$ respectively) and greater cannabis use frequency (ß = 0.41, $p < .01$) were significantly associated with greater CUDIT-R scores.

DISCUSSION

Findings from the current study provide insight into cannabis use patterns and factors associated with problem use in a diverse sample of adults ages 50 and over who reported at least monthly cannabis use. Participants endorsed use of a wide-range of cannabis products, most of which were THC-based, and various methods of ingestion. A substantial number of participants co-used cannabis with alcohol and/or nicotine, which may have health implications. Results illustrated notable trends across age, sex at birth, medical/non-medical cannabis use, and race/ethnicity. Findings contribute to the growing body of work related to cannabis use in older age groups, whose use of cannabis has increased as the status of cannabis changes across the U.S. (Han & Palamar, 2018, 2020).

Consistent with other studies focused on adults over age 50, females were less likely to smoke cannabis as their primary method of ingestion and used less frequently than males (Haug et al., 2017; Subbaraman & Kerr, 2021). Although men still tend to have higher rates of cannabis use, recent work suggests that this gap may be narrowing (Chapman et al., 2017). Trends noted in older adults may differ from younger adults due to cohort differences related to traditional gender norms and greater acceptance of cannabis use in the baby boomer generation (Han et al., 2017). Participants who self-reported medical cannabis use consumed cannabis more frequently than non-medical users, which could be associated with needing to maintain therapeutic benefits. Non-medical users were more likely to endorse cannabis smoking compared to medical users; however, half of medical users reported primarily smoking. Ingestion of harmful toxins via smoking vs. other consumption methods for medical cannabis users has received little attention and may be particularly pertinent for older adults with multiple health comorbidities. Lastly, similar to other studies with older adults, few participants endorsed use of concentrates (Livne et al., 2024; Yang et al., 2021). As a state, Hawai'i has low rates of dabbing (less than 4% dab their cannabis), which could reflect the absence of a legal non-medical cannabis market (State of Hawaii, 2024).

Racial/ethnic differences in specific cannabis use patterns were more prominent. White and multiracial participants reported the highest frequency of use, while Asians and NHPIs used

less often. Substantially greater numbers of NHPIs (83%) reported smoking their cannabis compared to other groups, which is of particular concern given the impact on lung functioning in this age group (Tan et al., 2019). Though evidence is still inconclusive due to limited studies and other methodological limitations, a recent systematic review examining four methods of cannabis ingestion (smoking, dabbing, vaping, and oral ingestion) found that smoking had the most significant respiratory and cardiovascular health effects (Muheriwa-Matemba et al., 2024). Due to greater risk of these health issues in older adults and among NHPIs, cannabis smoking in NHPIs should be monitored and further studied (Gordon et al., 2019).

We found significant racial/ethnic disparities related to having a state medical cannabis card and sourcing cannabis from medical dispensaries. Among medical users, White participants were the most likely to have a medical card. They were also the most likely to source their cannabis solely from dispensaries. NHPIs were the least likely racial/ethnic group to source their cannabis solely from medical dispensaries. This suggests a potential barrier to accessing legal, regulated, and safer cannabis for medical purposes. The literature is mixed when it comes to analyzing medical dispensary location by race/ethnicity and income, with some research demonstrating that medical dispensaries concentrate in neighborhoods with a greater number of racial/ethnic minority and lower-income groups (Cohn et al., 2023; Shi et al., 2016) and others finding the opposite (Cunningham et al., 2022; Yang et al., 2021). In Hawai'i, we suspect other factors such as a low cap on the number of medical dispensaries allowed to operate, cost, growing one's own cannabis, and lack of trust across multiple establishments (e.g., healthcare, government) may influence purchase habits related to medical cannabis. These factors may have been particularly influential for participants on some of the smaller and less populated Hawaiian islands, some of whom have no access to medical cannabis dispensaries (State of Hawaii, 2025).

Asian participants were more likely than other racial/ethnic groups to report use of CBD-only as their primary form of cannabis and were more likely to vape cannabis compared to other racial/ethnic groups. Research on cannabis use and patterns in Asian and NHPI populations is limited, but several epidemiological studies with adult populations have shown that Asian groups typically have the lowest rates of cannabis use, frequency, and CUD (Jeffers et al., 2021; Wu et al., 2016). Though no studies have examined vaping or CBD-only use as safer alternatives to smoking or THC-consumption in older adult Asian populations, a qualitative study found that vaping e-cigarettes was perceived by Asian Americans as less harmful than cigarettes (Maglalang et al., 2019). It is possible that such perceptions could be driving greater use of CBD and cannabis vaping among Asian populations.

Problem cannabis use, as assessed by scores on the CUDIT-R, was slightly lower in our sample compared to the few others that have assessed problem use in older adults (Haug et al., 2017). Despite this, 31% of participants scored above the cutoff for problem cannabis use on the CUDIT-R. Scores may have been impacted by sample differences (e.g., greater number of Asian participants) and method of recruitment from a healthcare system. Unsurprisingly, cannabis use frequency was associated with problem use, as demonstrated in studies with younger samples (Buu et al., 2017; Cooke et al., 2023; Khan et al., 2013). Smoking cannabis, as compared to other methods of ingestion, was associated with problem cannabis use. As a method of consumption, smoking cannabis is most likely to contribute to respiratory and other adverse health effects. Interventions for older adults might emphasize potential health risks and the increased risk of CUD associated with smoking, as well as promote alternative methods of consumption. Though vaping cannabis and the consumption of edibles are not necessarily safe, these methods may have less risk, especially if purchased through legal dispensaries that test their products.

Although one-third of participants solely used cannabis, over 70% of the sample used alcohol in the past 90 days. Older adults used alcohol more frequently than middle-aged adults. Recent work suggests that singular alcohol use and co-use with cannabis in adults over 50 is increasing (Kepner et al., 2023). Reasons for these trends are speculative, but cannabis policy and the use of alcohol to enhance the effects of cannabis potentially contribute to increased rates (Keyes, 2023). As a generation, baby boomer groups are

historically more likely to use substances than prior cohorts (Han et al., 2017), and this may have influenced the co-use patterns observed in our sample. Almost 10% of participants co-used cannabis and nicotine products. NHPIs were more likely than other groups to use cannabis, nicotine, and alcohol, which may contribute to higher health disparities overall. These findings have important implications for public health and clinical practice, due to medical and psychiatric consequences of polypharmacy (Crummy et al., 2020). The high rates of cannabis co-use with other substances underscore the need for comprehensive screening and integrated treatment approaches that address polysubstance use. Tailoring interventions and educational efforts to account for age, sex, race/ethnicity, and medical/non-medical use patterns may also improve their reach and effectiveness. Depending on the individual's goals related to cannabis, harm reduction strategies may be applicable regardless of medical or non-medical use. For example, older adults should be aware of protective strategies to avoid medication interactions and over-consumption, particularly when they have underlying health conditions. Those who are interested in cessation might consider evidence-based interventions, such as motivational interviewing or cognitive behavioral therapy (Calomarde-Gómez et al., 2021; Dellazizzo et al., 2023). Individuals with interest in medical cannabis might consider applying for a state-issued medical cannabis card to ensure use of safer products. However, to change purchase habits, it will be important to address any mistrust of government and medical systems operating dispensaries, as well as other structural barriers (Valencia et al., 2017).

While this study contributes to the limited knowledge base on cannabis use in adults over age 50, it also has limitations. The sample was 68% White, which is greater than census figures for Hawai'i (U.S. Census Bureau, 2021). While we are unsure if underrepresented groups were hesitant to participate, White health system members and those using cannabis legally via the state medical cannabis program may have been more comfortable endorsing cannabis use via a survey

delivered through their healthcare provider. Future similar studies might consider oversampling participants from underrepresented groups to ensure a more diverse sample. Despite low numbers, 12% of our sample included NHPI participants, who are often excluded from samples due to low numbers or are merged with Asian groups (Montgomery et al., 2022; Saraiya et al., 2024), despite evidence that they demonstrate marked health disparities (Gordon et al., 2019). Our questions regarding nicotine products were limited to cigarettes and e-cigarettes. Although cigarettes are the primary method of tobacco consumption among older adults (Cornelius et al., 2023), alternative modes such as cigars or chewing tobacco were not assessed, potentially leading to under-identification of nicotine users. Participants were recruited from one state (Hawai'i) that does not have legal non-medical cannabis. All participants in the study had health insurance, and although Kaiser Permanente represents a range of employer- and publicly-supported insurance plans (e.g., Medicaid), findings may not be generalizable to uninsured groups or those living in states with legal non-medical (recreational) cannabis. However, Hawai'i has a long history of cannabis use and a large representation of Asian and NPHI groups and retirees, whose use of cannabis is understudied.

Conclusions

As cannabis is used increasingly for medical and non-medical purposes, it is critical to better understand patterns of use and their effect on aging populations. Findings highlight the importance of considering demographic factors when developing and implementing cannabis-related policies, programs, and interventions to meet the unique needs of this growing population of users. Future studies should further examine the implications of polysubstance use among older adults, smoking cannabis alone and with nicotine, and the impact of select patterns on risk for CUD. Ultimately, a more comprehensive understanding will be essential to guide intervention efforts among adults over 50 who choose to use cannabis.

Table 1. *Sociodemographic Characteristics, Cannabis, and Other Substance Use Among Adults Ages 50+ Who Reported Recent Cannabis Use*

Variable	*n* (%)	*n* (%)	*M*	*SD*
Age (years)			65.9	8.6
Age group				
50-64	153 (41.7)			
65+	214 (58.3)			
Sex assigned at birth				
Female	158 (43.1)			
Male	204 (55.6)			
Missing or other	5 (1.3)			
Gender identification				
Woman	156 (42.5)			
Man	201 (54.8)			
Trans Man	1 (0.3)			
Trans Woman	1 (0.3)			
Genderqueer/Non-conforming/Another	8 (2.1)			
Employment status				
Full-time	99 (27.0)			
Part-time	43 (11.7)			
Retired or not working	201 (54.8)			
Other	24 (6.5)			
Race/ethnicity				
White	249 (67.9)			
NHPI	45 (12.3)			
Asian	34 (9.3)			
Multiracial	25 (6.8)			
Unknown/other	14 (3.8)			
Island of residence				
Oʻahu	179 (49.2)			
Hawaiʻi (Big Island)	112 (30.8)			
Maui	69 (19.0)			
Kauaʻi	3 (0.8)			
Molokaʻi	1 (0.3)			
Form of cannabis used*				
Flower	208 (59.9)			
Edibles	58 (16.7)			
Skin products	7 (2.0)			
Concentrates	10 (2.9)			
CBD-only (any form)	22 (6.3)			
Vape products	22 (6.3)			
Other	20 (5.8)			
Cannabis ingestion method				
Smoke[a]	196 (56.7)			
Joint		68 (34.7%)		
Blunt		2 (1%)		
Hand pipe/small pipe		100 (51.0%)		
Bong		26 (13.3%)		
Vape	41 (11.9)			
Oral consumption	76 (22.0)			
Skin application	21 (6.1)			
Dab rig	4 (1.2)			
Other	8 (2.3)			
Purpose of cannabis use				
Medical-only	79 (25.0)			
Non-medical-only	86 (27.2)			

Both medical and non-medical	151 (47.8)		
Co-use of cannabis with other substances			
Cannabis only	106 (29.9)		
Cannabis with alcohol	216 (60.9)		
Cannabis with cigarettes/e-cigarettes	13 (3.7)		
Cannabis with alcohol and cigarettes/e-cigarettes	20 (5.6)		
State medical cannabis card[b]	114 (50.0)		
Medical dispensary use only	93 (27.6)		
Days cannabis use (0-30)		18.7	11.5
Any alcohol use (past 90 days)	251 (71.4)		
Days alcohol use (0-30)		7	9.3
Current nicotine use	33 (9.3)		
Total CUDIT-R score		7.4	4.5
CUDIT-R score ≥9	106 (30.6)		

Note. *Unless indicated, all cannabis forms include THC or a THC/CBD blend; CUDIT-R = Cannabis Use Disorders Identification Test, Revised; [a]Smoking included specific methods that are indicated in the third column; column 2 reflects the total number and percentage who reported smoking, while column 3 indicates the number who used each specific smoking method and the percentage out of total smoking; [b]Of the full sample, only participants who reported any medical use ($n = 230$) were asked if they have a State of Hawai'i medical cannabis card. Of those who responded to this question, 114 (50%) reported having a medical card.

Table 2. *Differences in Cannabis and Co-Use Patterns by Participant Demographics and Medical/Non-Medical Use*

VARIABLE	AGE GROUP			SEX AT BIRTH			RACE[R]					NON-MEDICAL/MEDICAL USE		
	50-64 (n = 153)	65+ (n = 214)	p-value	Male (n = 204)	Female (n = 158)	p-value	White (n = 249)	Asian (n = 34)	NHPI[1] (n = 45)	2+[2]	p-value	Non-Medical Use Only (n = 86)	Any Medical Use (n = 230)	p-value
Days cannabis use (0-30): M (SD)	17.7 (12.0)	19.5 (11.1)	.1627	19.2 (11.3)	18.0 (11.7)	.3602	20.1 (11.1)	14.7 (11.9)	14.3 (11.9)	20.7 (11.6)	.0035	13.7 (11.2)	20.9 (10.8)	<.0001
Form of cannabis used*: n (%)														
CBD-only products	10 (6.9)	12 (5.9)	.8627	9 (4.7)	13 (8.7)	.0709	10 (4.2)	7 (20.6)	<5	<5	.0032	<5	17 (7.4)	.0595
Flower	84 (58.3)	124 (61.1)		124 (64.3)	81 (54.0)		139 (58.4)	17 (50.0)	31 (77.5)	15 (65.2)		62 (72.1)	132 (57.4)	
Concentrates	5 (3.5)	5 (2.5)		7 (3.6)	<5		9 (3.8)	<5	<5	<5		<5	8 (3.5)	
Edibles	27 (18.8)	31 (15.3)		32 (16.6)	25 (16.7)		44 (18.5)	5 (14.7)	<5	<5		16 (18.6)	38 (16.5)	
Vape Products	9 (6.3)	13 (6.4)		12 (6.2)	10 (6.7)		19 (8.0)	<5	<5	<5		<5	16 (7.0)	
Skin Products, other, don't know	9 (6.4)	18 (8.9)		9 (4.7)	18 (12.0)		17 (7.1)	<5	<5	<5		<5	19 (8.3)	
Cannabis ingestion method: n (%)														
Smoke	85 (59.0)	111 (55.0)	.8758	118 (61.5)	76 (50.7)	.0129	128 (54.0)	12 (35.3)	33 (82.5)	15 (65.2)	.0002	58 (68.2)	126 (54.8)	.0206
Vape	17 (11.8)	24 (11.9)		22 (11.5)	19 (12.7)		30 (12.7)	8 (23.5)	<5	<5		6 (7.1)	28 (12.2)	
Edibles	29 (20.1)	47 (23.3)		42 (21.9)	32 (21.3)		60 (25.3)	8 (23.5)	<5	<5		19 (22.4)	48 (20.9)	
Apply oils/creams, dab rig, other	13 (9.0)	20 (9.9)		10 (5.2)	23 (15.3)		19 (8.0)	6 (17.7)	5 (12.5)	<5		<5	28 (12.2)	
Source of cannabis: n (%)														
ONLY from medical dispensary	36 (26.1)	57 (28.6)	.6057	53 (28.6)	39 (26.4)	.6413	76 (33.0)	8 (24.2)	5 (12.8)	3 (13.0)	.0181	8 (10.0)	76 (33.5)	<.0001
Obtain other ways	102 (73.9)	142 (71.4)		132 (71.4)	109 (73.6)		154 (67.0)	25 (76.8)	34 (87.2)	20 (87.0)		72 (90.0)	151 (66.5)	
State medical card[a]: n (%)	54 (55.7)	60 (45.8)	.1406	63 (53.4)	50 (45.9)	.2577	89 (56.0)	7 (30.4)	8 (40.0)	6 (31.6)	.0272	N/A	114 (50.0)	N/A
Total CUDIT-R score: M (SD)	7.8 (4.5)	7.1 (4.5)	.1790	7.9 (4.6)	6.7 (4.3)	.0107	7.4 (4.5)	6.9 (5.3)	7.5 (4.0)	8.0 (4.8)	.8250	7.0 (4.1)	7.7 (4.7)	.1918
CUDIT-R score ≥9: n (%)	52 (36.1)	54 (26.6)	.0581	72 (37.3)	32 (21.3)	.0014	68 (28.6)	10 (29.4)	15 (37.5)	8 (34.8)	.6706	20 (23.3)	77 (33.5)	.0795
Days alcohol used (0-30): M (SD)	5.9 (8.1)	7.8 (10.0)	.0465	7.7 (9.5)	6.0 (8.9)	.0798	8.3 (9.9)	3.1 (6.1)	3.3 (5.5)	6.4 (10.3)	.0005	8.1 (9.2)	6.4 (9.0)	.1232
Nicotine use: n (%)	18 (12.3)	15 (7.2)	.1000	20 (10.1)	13 (8.5)	.6096	16 (6.6)	<5	8 (19.0)	<5	.0239	11 (12.8)	17 (7.4)	.1328
Co-use of cannabis with other substances: n (%)														
Cannabis-only	48 (32.9)	58 (27.8)	.0721	53 (26.8)	52 (34.0)	.0910	63 (25.9)	13 (38.2)	13 (31.0)	12 (50.0)	.0073	17 (19.8)	76 (33.0)	.0890
Cannabis+alcohol	80 (54.8)	136 (65.1)		125 (63.1)	88 (57.5)		164 (67.5)	17 (50.0)	21 (50.0)	8 (33.3)		58 (67.4)	137 (59.6)	
Cannabis+nicotine	5 (3.4)	8 (3.8)		5 (2.5)	8 (5.2)		8 (3.3)	<5	<5	<5		<5	7 (3.0)	
Cannabis+alcohol+nicotine	13 (8.9)	7 (3.4)		15 (7.6)	5 (3.3)		8 (3.3)	<5	5 (11.9)	<5		7 (8.1)	10 (4.3)	

Note. *Unless indicated, all cannabis forms include THC or a THC/CBD blend; [R]14 individuals who reported Black, American Indian or Alaskan Native, other, or who skipped item were excluded from Race statistics; [1]Native Hawaiian / Pacific Islander; [2]More than one race; [a]Only participants who reported any medical use (n = 230) were asked if they have a State of Hawai'i medical cannabis card; Cells with counts less than 5 are denoted as such, but the actual value is used in the statistical calculations; CUDIT-R = Cannabis Use Disorders Identification Test, Revised.

Table 3. *Factors Associated with CUDIT-R Total Score*

Variable	CUDIT-R TOTAL	
	Estimate (SE)	*p*-value
Sex at birth		
Male[R]		
Female	-0.63(0.45)	.1608
Days cannabis use (0-30)	0.14 (0.02)	<.0001
Cannabis ingestion method		
Smoke[R]		
Vape	-1.56 (0.89)	.0801
Edibles	-2.55 (0.89)	.0047
Apply oils/creams, dab rig, other	-2.62 (1.10)	.0179
Form of cannabis used*		
Edibles[R]		
Skin products, other, don't know	-1.29 (1.16)	.2672
CBD only products	-1.89 (1.17)	.1069
Flower, THC or THC/CBD blend	-0.40 (0.97)	.6813
Concentrates, THC	0.60 (1.60)	.7053
Vape products, THC or THC/CBD blend	-0.94 (1.38)	.4961

Note. [R]reference group; *Unless indicated, all cannabis forms include THC or a THC/CBD blend; CUDIT-R = Cannabis Use Disorders Identification Test, Revised

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