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"Smoking weed it gets you over the hump": Cannabis co-use as a facilitator of decreased opioid use among people who inject drugs in Los Angeles, California

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HIGHLIGHTS

- PWID were recruited at community sites and sample reports 57 % housing instability.
- PWID used cannabis for cravings and anxiety after stopping opioid use to remain in "maintenance."
- Cannabis provided rapid relief from opioid withdrawal reducing frequency of opioid use.
- Low barrier access to cannabis due to legalization facilitated co-using to decrease opioid use.

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ABSTRACT

Introduction: Opioid overdose mortality rates have surged dramatically in the last decade due largely to fentanyl in the illicit US drug supply. As of June 2024, 38 states, three territories, namely US Virgin Islands, Guam and the Northern Mariana Islands, and the District of Columbia, allow the medical use of cannabis products. However, there remains limited qualitative community-based evidence on the role of cannabis co-use among opioid using and injecting populations. In this study, we present data from people who inject drugs (PWID)'s co-use of cannabis-opioid.

Methods: We conducted 30 one-on-one semi-structured interviews with PWID from July 2021 to April 2022 at two community sites in Los Angeles, CA, near a syringe service program and a methadone clinic. Interviews were recorded and transcribed. We used constructivist grounded theory methods for identifying and comparing the emerging themes that appeared across transcripts to construct a conceptual explanation of how PWID co-used cannabis and opioids. Participant inclusion criteria included injection drug use, opioid and cannabis use, English fluency, and age 18+ years.

Results: PWID described that cannabis co-use assisted in developing patterns of reduced opioid use in a number of ways: 1) maintain opioid cessation and/or adhere to opioid use disorder treatment by managing cessation-specific symptoms, 2) manage symptoms of opioid withdrawal episodically and, 3) decrease opioid use due to low barrier accessibility of cannabis.

Discussion: Participants reported myriad benefits of opioid and cannabis co-use for reducing patterns of opioid use. These findings have two major harm reduction implications for PWID: 1) the distribution of cannabis via low threshold peer programming and interventions can facilitate changes in opioid use patterns and 2) access to cannabis co-use, potentially alongside existing Medication for Opioid Use Disorder, in treatment settings may improve efficacy of uptake and treatment outcomes and goals for individual PWID.

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1. Introduction

Opioid overdose rates have risen dramatically over the last decade (National Institute on Drug Abuse). As of June 2024, 38 states, three territories (namely the US Virgin Islands, Guam and the Northern Mariana Islands), and the District of Columbia allow the medical use of cannabis products. Adult non-medical use, otherwise known as recreational use, of cannabis is legal in 24 states, the District of Columbia and the previously mentioned territories (Klieger et al., 2017). With widespread cannabis legalization, availability, and access to cannabis has increased which has mixed implications for co-use (Smart and Pacula, 2019).

Cannabis legalization and resulting effects such as increase in number of dispensaries have implications for the ongoing opioid mortality crisis. A systematic literature review found that states that legalized medical cannabis had lower prescription opioid overdose mortality rates (Vyas et al., 2018). One of the studies in this review found that the availability of medical cannabis dispensaries decreased treatment admissions for prescription opioid addiction and opioid overdose fatalities (Powell et al., 2018a,2018b). Another study in this review reported that medical cannabis laws are associated with 24.8 % lower state-level fatal prescription opioid overdoses compared to states without such laws indicative of the role of structural interventions for reducing fatal opioid overdose (Bachhuber et al., 2014). However, other analyses (Powell et al., 2018a,2018b) have indicated this association may be driven by state-level variation in medical cannabis regulations rather than mere legalization of medical cannabis dispensing. A recent study that considered both medical and recreational cannabis dispensaries found a negative relationship between number of cannabis dispensaries (Hsu and Kovács, 2021; Castillo-Carniglia et al., 2023) and age-adjusted opioid mortality suggesting that greater availability of cannabis may influence patterns of opioid-related mortality.

Reducing opioid use via cannabis substitution (using cannabis in place of other substances such as opioids) and co-use (using cannabis with opioids) has been reported in the extant data (Ceasar et al., 2021; Reddon et al., 2023; Mok et al., 2023; Mok et al., 2021). In Canada, Among patients registered to purchase cannabis from a federally sanctioned licensed provider for medical purposes, 30 % reported substituting it for prescription opioids (Lucas and Walsh, 2017). Similarly, a study in Washington State found that 46 % of participants used cannabis as a substitute for prescription drugs of which narcotics/opioids constituted 35.8 % (Corroon et al., 2017). Additional research from Vancouver, Canada reported a 16 % increase in cessation of opioid injection linked to daily cannabis use (Reddon et al., 2020). However, it is important to note that the current landscape of evidence presents mixed findings on cannabis and opioid co-use suggesting that it may or may not decrease opioid use in some populations (Smart and Pacula, 2019) (Kim et al., 2023)(Buttorff et al., 2023).

There remains little clinical or community-based evidence on the role of cannabis use among opioid using and injecting populations. In this paper we explore how opioid-using people who use inject drugs (PWID) are using cannabis to change their patterns of opioid use. While there is a growing nationwide interest in cannabis use among this population, there have been few examinations of the impact of cannabis on opioid using and injecting populations in community settings (Larochelle et al., 2018). This qualitative study was a part of a longitudinal, prospective cohort study to determine if changes in cannabis use frequency are associated with changes in frequency of opioid use and opioid-related health outcomes among opioid-using PWID in California and Colorado, states with legal medicinal and adult recreational use. This data was collected in California which has the longest history of cannabis legalization in the country. In California, medical cannabis has been legal since 1996 and recreational since 2018 ((Department of Cannabis Control - State of California)(California Department of Justice Releases New Medicinal Cannabis Guidelines, 2019)(Cannabis 101 – Consumer & Business, n.d.)). Qualitative, community-recruited perspectives from PWID are a gap in the current literature. Our study sought to explore perspectives around co-use among people who use opioids within this population in Los Angeles, California.

2. Methods

2.1. Participants and procedures

This qualitative study recruited and interviewed 30 participants (n=30) (Ligita et al., 2019) (Zinberg, 1984) (Charmaz, 2012, 2014). Qualitative data were collected as a part of a longitudinal, prospective cohort study to determine if changes in cannabis use frequency were associated with changes in frequency of opioid use and opioid-related health outcomes among opioid-using people who inject drugs (PWID) in two states with legal medicinal and recreational cannabis in Los Angeles, CA and Denver, CO. This qualitative study includes data from the Los Angeles cohort. Interviews were conducted at two community sites, one affiliated with a syringe services program and another close to a methadone clinic in Los Angeles, California from July 2021 to April 2022. Inclusion criteria for this study were: 1) being 18 years of age or older, 2) any opioid use and self-reported injection drug use within the past 30 days, which was confirmed by visual inspection of injection sites (Cagle et al., 2002), 3) cannabis use, and 4) English fluency. Research study staff informed potential study participants about the ongoing qualitative study. This generated a convenience sample of interested participants who were verbally screened for eligibility criteria and scheduled day-of and on-site. Participants provided written informed consent and received $40 upon interview completion. Interviews were conducted in-person and lasted approximately 45–60 minutes. Each interview was led by one author (RCC). Study procedures were reviewed and approved by the University of Southern California IRB.

2.2. Semi-structured qualitative interviews

The semi-structured, in-person interviews were conducted regarding patterns, preferences, and experiences of opioid and cannabis co-use. The interview guide was developed using existing qualitative and quantitative literature (Charmaz and Thornberg, 2021) (*National Institute on Minority Health and Health Disparities Research Framework*) (Appendix 1: Interview Guide). The semi-structured interview guide was developed to collect exploratory data on key issues related to: 1) views of cannabis use with the goal of identifying beliefs, motivations, prior experiences, and current cannabis use patterns in relationship to opioid use patterns over time, and 2) to explore how views of cannabis use align with changes in cannabis and opioid use patterns over time (e.g., substitution of one for the other, escalation of both, diminishment of both, and no change). During these 1:1 interviews, the researcher (RCC) asked in-depth, open-ended (i.e., qualitative) questions about cannabis use motivations and changes in cannabis/opioid ratios among opioid-using PWID. The interview guide was iteratively revised throughout data collection to generate richer responses based on participant responses and emerging themes (e.g., what health conditions participants reported co-using cannabis and opioids to treat) (Ligita et al., 2019) (Charmaz, 2014) (Charmaz, 2012). Interviews were conducted until data saturation was achieved, meaning no new themes were emerging (Weller et al., 2018). Interviews for this study were audio-recorded and transcribed by a third-party IRB-approved provider who de-identified transcripts before uploading to Health Insurance Portability and Accountability Act (HIPAA)-compliant OneDrive for analysis.

2.3. Analysis: constructivist grounded theory

We analyzed data using constructivist grounded theory methods, where our aim was to develop a conceptual framework or theory via constant comparisons across the data around an area of inquiry, in this case cannabis and opioid co-use (Charmaz and Thornberg, 2021)

(Charmaz, 2014) (Charmaz, 2012). This collective process involved research staff (EEG), undergraduate, masters (CO), and a doctoral public health student (SSG) as well as the PI (RCC) who were involved with reading, summarizing, and memoing the transcripts to engage deeply with multiple interpretations of the phenomenon of interest. The research team started with line-by-line reading and memoing of transcripts. These memos allowed us to develop initial codes and organize them into a codebook with global codes and categories that emerged from the data (Charmaz, 2006). We approached coding as an emergent process, allowing new and unexpected ideas to come up (Charmaz, 2006). To facilitate this, the research team split transcripts among 3 researchers (SSG, EEG, and CO). To analyze data, we uploaded the transcripts into ATLAS.ti™ data software program, Mac Version 22.1.0. We imported into ATLAS.ti™. The codebook consisted of a set of 26 thematic codes (Appendix 2: Codebook) for analysis based on emerging subject areas across transcripts. The codebook (names of the codes, description of the codes, and development of codes) was iteratively revised for the first 5 interviews after triangulation between the coding team and their understanding of the codebook. This dynamic process included weekly meetings that allowed the team to come up with a final version of the codebook that reflected the team's shared and individual interpretations of the codes as reflected in the participants' experiences documented in the data (See Appendix X: Codebook).

ATLAS.ti™ was used hereafter to code and generate individual final memos of the data. For this study, we also focused on incident-by-incident memoing, a type of memoing that lets us compare significant events, processes, and dissimilar events in participants' lives (Charmaz, 2006). The team coded transcripts based on the codebook and met weekly to discuss theoretical concepts as we developed our final memos for each transcript and thematic categories crosscutting the transcripts. These weekly discussions (SSG, EEG) included recording research questions, constructing theories, co-generating memos, and discussing understanding and application of codes. While the team measured interrater reliability via ATLAS.ti, this process was used to facilitate our discussions of how codes were being interpreted by researchers and generate memos to compare observations, deviations, and track emerging ideas that would facilitate the development of theoretical concepts. These weekly analytic meetings spanned 2–3 hours per week for over 15 weeks and allowed us to engage in reflexive discussions, triangulate ideas between researchers, and construct the theories we were reporting. EEG and SSG used analytic meetings and memos to discuss our evolving and diverging applications and meanings of codes with the goal of generating memos that ultimately lead to the following results. The analysis of the in-depth interviews yielded three theories as they pertain to cannabis and opioid co-use motivations: participant perspectives on cannabis for opioid withdrawal management, accessing cannabis to reduce opioid use, and using cannabis to maintain reduced opioid use.

3. Results

We retrieved sociodemographic characteristics of the analytic qualitative sample (n=30) from the longitudinal dataset (Table 1). Median age of participants was 39.5 years (interquartile range = 33 – 46 years) and 70.0 % identified as cis-male. This sample was 43.3 % non-Hispanic white, 30.0 % Hispanic/Latinx, 6.7 % non-Hispanic Black, 6.7 % Native American, 3.3 % Asian, and 10.0 % other race/ethnicity. The majority of participants reported having a high school education or greater (80.0 %), having an income less than $2100 in the past 30 days (70.0 %), and being homeless or unstably housed in the past 3 months (56.7 %).

We constructed three themes: Participants described using cannabis 1) for post opioid-cessation to remain in "maintenance" 2) to manage symptoms of opioid withdrawal and 3) to decrease opioid use due to cannabis low barrier accessibility.

Table 1
Sociodemographic characteristics among people who inject drugs and use opioids (n=30) in Los Angeles, California 2021 – 2022.

Participant Characteristics	Mean (SD)/Frequency (%)
Age	41.5 (11.16)
Race/Ethnicity	
White	13 (43.3 %)
Latinx	9 (30.0 %)
Black	2 (6.7 %)
Native	2 (6.7 %)
Asian	1 (3.3 %)
Other	3 (10.0 %)
Gender	
Male	21 (70.0 %)
Female	8 (26.7 %)
Other	1 (3.3 %)
Education	
Did not complete High School	6 (20.0 %)
Completed High School or More	24 (80.0 %)
Income level	
Less than $1000	12 (40.0 %)
$1000 to $1400	3 (10.0 %)
$1401 to $2100	6 (20.0 %)
$2101 or more	9 (30.0 %)
Housing Stability (Unstably Housed)	
Yes	17 (56.67 %)
No	13 (43.33 %)

3.1. To facilitate being in "maintenance," participants used cannabis to manage specific symptoms (i.e. cravings and anxiety) in the period after stopping opioid use and no longer being in withdrawal

Participants described periods when they had stopped using opioids. After stopping opioid use, they noted the emergence of symptoms which included anxiety and cravings. This participant described how cannabis co-use with medication for opioid use disorder (MOUD) helped with managing anxiety symptoms associated with the period immediately following the cessation of opioid use:

> *"[Cannabis is] a lifesaver … I'll be on the suboxone, and with that, there's the anxiety. Once you get off the heroin, you get this mad rush of anxiety. So that's where the weed comes into play. And so I will smoke a lot more weed during that time of kicking. That week, I will smoke as much as I possibly can."* (**5079 – 35, Male, Unhoused/unstably housed**)

Participants also described using cannabis to mitigate opioid cravings after they had stopped regular use and were no longer experiencing withdrawal symptoms. This person reported that it helped them to "get over the hump" of craving opioids and continue not to use.

> *"I was really trying to get off of opiates and using weed, really helps to not have the first urge to use opiates. When you're addicted and you have a habit, then you have to use opiates. But when you don't have a habit and you're not getting sick from it every day, when you're smoking weed it gets you over the hump and that urge to get high for the first time. And that's what's so special out weed."* (**5115 – 26, Male, Housed**)

This participant also described using cannabis for post-opioid cessation "maintenance," but noted that healthcare provider perceptions toward cannabis use were biased. They felt that providers could be facilitators to this change with adequate understanding of how cannabis supports opioid cessation in individual patients lived and living experiences:

> *"[S]ome people can use pot to stay off of it. Whereas doctors will say, 'Oh no, it's not true. People that use pot, they're just jonesing to get high.' Some people really use weed as a maintenance to stay off opiates. I truly believe that. And doctors need to look into it and start really being okay with that. …Marijuana, maybe this is a real thing."* (**5115 – 26, Male, Housed**)

Another participant described how cannabis helped their post-opioid cessation by using it in tandem with MOUDs. They initially used both methadone and cannabis, but were able to transition to cannabis alone and still avoid opioid use:

"When I was clean with methadone I tapered down [my methadone] but I was using methadone and marijuana only. And that helped me stay clean and then I used marijuana after I completely went off all opiates. And it did help me stay away from it. " **(5066 – 32, Male, Housed)**

3.2. Using cannabis to provide rapid and ongoing relief from opioid withdrawal symptoms led to less frequent opioid use

Participants described episodic use of cannabis to manage and alleviate their opioid withdrawal symptoms. For example, one person described others advising them to use cannabis to get through a debilitating heroin withdrawal episode and passing along that knowledge due to their own positive experience.

"The first time that I stopped using heroin, my daughter was there, she was around and she was the one smoking marijuana and so she told me here, use this. I told her I was in a lot of pain [due to heroin withdrawal]. I was under six different blankets, I could not regulate my temperature. It was really uncomfortable and I was throwing up and she's like, 'Here, you gotta eat something, smoke some weed." And it was amazing, how it just took like fifty percent of the uncomfortability away. If I ever see anybody sick I tell them 'Here, hit a joint. It'll help you.' And it does, it helps a lot." **(5100 – 48, Female, Unhoused/Unstably housed)**

Another participant described how they managed the physical pain related with heroin withdrawal by using cannabis.

"I constantly need to have a pipe or a joint in my hand. I may not totally be hitting it all the time, but I've got to constantly have it. I'd say every five minutes I'll take a hit, and I've got to constantly smoke it all day long until I get the heroin, otherwise… Say I got no more [heroin], my bones are starting to ache, my back hurts really bad and I know that's all from the opiate use because I know the feeling without it. You know, I know how it feels so I smoke more pot, more pot and more pot to kill the pain." **(5120 – 67, Female, Unhoused/Unstably housed)**

Some participants stated how cannabis prolonged time in between heroin injection frequency by managing their physical symptoms.

"Until I get heroin, I have to smoke more pot. I do have to constantly be smoking pot to keep my body in line until I have the heroin." **(5125 – 35, Male, Housed)**

3.3. Low-barrier accessibility was a key factor in participants' reliance on cannabis as a resource to decrease opioid use

Participants in this study described how co-using cannabis with opioids reduced their use of opioids. They reported that because of access to cannabis they were implementing cannabis as an aid to reduce their opioid use, resulting in behavioral shifts and changes in use patterns.

This participant described their experience with increased access to cannabis due to the large number of dispensaries in their area. For them, dispensaries had "better" products because they were able to meet this participant's product preferences:

"[I]t's easy to get cannabis. Every other pretty much corner has a weed shop… when I go into [a] dispensary, I know what I'm getting, I know what I want… Usually they just have better stuff." **((5106 – 31, Male, Housed)**

As a result of being able to access cannabis via dispensaries, one participant described changes in patterns of opioid use, such as cutting down fentanyl use to about half of their regular frequency when they have cannabis.

"[If I don't have cannabis] I smoke fentanyl every two hours. [And when I have cannabis, I smoke fentanyl] about every three to four hours." **(5106 – 31, Male, Housed)**

Another respondent described how they were able to reduce their opioid use by accessing cannabis dispensaries and integration of cannabis into their routine:

"I went to the weed shop, and it [being able to access cannabis at a dispensary] was such a big difference. I even cut down on my opioid use, like barely [using] any" **(5145 – 34, Male, Unhoused/unstably housed)**

Another participant reported using cannabis to change their use of opioids during their morning routine by facilitating productivity, getting things done, and reducing the craving for opioids. They described how they are currently waiting to hear back from a MOUD clinic about a suboxone prescription and are using cannabis to reduce their daily fentanyl intake during this waiting period.

"I called [the MOUD clinic for a Suboxone prescription] … So I'm waiting on that… I've brought [fentanyl] down to twice a day…cannabis is helping me [because] instead of…doing another [shot of fentanyl] later, I'll smoke cannabis instead and I kind of forget about the fentanyl and keep riding along or doing my errands or doing what I need to do to get anything done." **(5066–32, Male Unhoused/unstably housed)**

This participant described why they prefer accessing cannabis at a dispensary citing concerns around safety and illegality when procuring street-based cannabis. On the contrary, the note that logs and identification can lead to concerns around privacy and surveillance which may deter some people from dispensaries:

"It's better to go to a dispensary. I don't even understand why anybody would just want to buy it from someone, unless because they don't want to be in some kind of system or whatever. If they feel like their name is out there. Well, I mean, [I like dispensaries because] I don't have to deal with meeting up with somebody on the street. And having it be, like, illegal. And then they have like the tinctures, and then the gummies and all of that." (**5025 – 39 Male Unhoused/unstably housed**)

4. Discussion

The main contribution of this study is to provide context about individual and structural factors that shape cannabis co-use to lower opioid use among a sample of largely unhoused and indigent PWID. In this study, PWID described multi-level factors from symptom management and cessation 'maintenance' to structural drivers such as access via dispensaries and criminal-justice involvement that shaped their cannabis co-use and/or substitution behaviors. Participants described using cannabis in the period following opioid cessation to manage symptoms such as cravings and cessation-related anxiety, using cannabis to manage opioid withdrawal symptoms, and attributed cannabis co–use and substitution to accessibility via dispensaries and legalization. Given the high rates of housing insecurity/instability and material deprivation reported by this analytic sample, these qualitative, community-recruited findings contextualize extant data to expand the literature via reports of PWID experiencing overlapping social inequities.

Concurrent with existing literature, our findings support the use of cannabis with MOUD. Participants in our study described using cannabis post opioid cessation to manage symptoms such as cessation-related anxiety and cravings. Some participants did this by using cannabis along with MOUD for self-initiated opioid cessation. Methadone dosing takes place in 4 stages: dose initiation, induction, stabilization, and maintenance. This titration is federally regulated (Scavone et al., 2013). Existing data show that methadone maintenance treatment (MMT) patients who used cannabis during the methadone stabilization phase reported lower opioid withdrawal ratings (Scavone et al., 2013). Several participants reported the effectiveness of cannabis to remain in

"maintenance" suggesting that co-use of cannabis and methadone for opioid cessation adherence should be examined in future clinical research. These findings along with the extant data (Beaugard et al., 2024) further support expanded integration of cannabis and MOUD in treatment settings for substance use disorder (SUD). In a study comparing cananbis use vs non-use among individuals who were enrolled at a substance use treatment program, cannabis (Scavone et al., 2013) use did not compromise positive treatment outcomes such as program completion (Swartz, 2010). Further data supporting the integration of cannabis with treatment for opioid use disorder shows that people initiating opioid agonist treatment (methadone or buprenorphine/naloxone based) showed a 21 % higher retention in treatment that was associated with at-least daily cannabis use compared to less than daily consumption (Socías et al., 2018). Data from patients on MMT showed that the likelihood of nonfatal opioid overdose in the past year was 71 % lower among participants who self-reported cannabis use (Bryson et al., 2021).

Some participants in our study reported how managing withdrawal with cannabis helps to reduce frequency of opioid use. In a study on the use of cannabis to decrease injection frequency, opioid use frequency was significantly lower for people who used cannabis compared to those who did not (Corsi et al., 2015). Participants in our study found cannabis to be an effective and fast-acting option for opioid withdrawal management. This included management of physical symptoms like severe pain and chills and mental health symptoms like withdrawal onset-related anxiety. A qualitative study reported that individuals transitioning from low frequency heroin use to abstinence smoked cannabis to reduce anxiety and cravings experienced during the transition period (Wenger et al., 2014). Confirming these previous findings, our study adds knowledge about the role of cannabis in managing acute physical symptoms from opioid withdrawal. In a study on substituting cannabis for opioid-based pain medication, 97 % percent of the sample affirmed that cannabis helped decrease opioid use and 81 % reported that cannabis alone (compared to cannabis-opioid co-use) effectively managed their pain (Reiman et al., 2017). There is existing literature supporting substitution of cannabis among opioid-using patients experiencing pain (Kral et al., 2015). Cannabis use among patients with chronic pain was associated with 64 % lower opioid use, better quality of life, and fewer medication side effects and medications used (Boehnke et al., 2016). Data evaluating cannabis as a substitute for prescription drugs provide further evidence that individuals are using cannabis as a substitute for prescription drugs, particularly, opioids (Corroon et al., 2017). Our findings contextualized within the current literature suggest that integrating cannabis into opioid use disorder (OUD) and pain management treatment protocols for people who use opioids (PWUO) should be considered.

Participants emphasized accessibility in co-using cannabis to decrease opioid use. They described how wider sociostructural factors including the legalization of cannabis and increase in dispensaries facilitated cannabis procurement. Participants noted how dispensaries allowed for easier access – one participant described relying on cannabis when faced with barriers to getting MOUD. While increasing access to MOUD continues to be a public health priority, our findings point to the important role of legalization that allows for low-threshold access to cannabis. In addition to cannabis' ability to provide symptomatic relief, PWID experiencing major social and structural inequities may be able to access cannabis more easily than other treatment modalities, contributing to its viability for opioid co-use and substitution.

While data on formal programs centering cannabis for OUD are lacking (Lake and Pierre, 2020), grassroots cannabis programming is an effective intervention for peer support and low-threshold resources. Cannabis appears to be effective alongside medication management for substance use disorders (Scavone et al., 2013) (Swartz, 2010) (Socías et al., 2018) (Bryson et al., 2021) and grassroots initiatives around the globe have documented the effectiveness of peer-based cannabis distribution (Valleriani et al., 2020) (Pardal and Bawin, 2018). Participants in prior research reported that the availability of free distribution programs helped them access cannabis or obtain more cannabis than would otherwise be financially viable (Valleriani et al., 2020). Given the healthcare stigma and barriers to cannabis use within housing programs (Valleriani et al., 2020), we would be remiss if we did not convey some reasons for the effectiveness of this peer-led program and the role of community-based programming in intervention development. Participants in our study noted dispensaries to be a major access point for cannabis. However, 57 % of our sample is unhoused or unstably housed and 70 % reported a monthly income less than $2100 indicating that despite legal and physical access there are still financial barriers to note. Our findings expand the literature on cannabis legalization and opioid co-use to emphasize the possible benefits of accessible cannabis distribution programs, especially for indigent and unstably housed PWID. In Vancouver, an exploration of PWID perspectives on the role of grassroots cannabis distribution programs showed that participants support the development of low barrier, community-based, and peer-led distribution programs (Valleriani et al., 2020). These programs are favored over programs embedded within medical systems due to less access-related barriers such as cost, physician support, and requirements for personal identification and credit cards (Valleriani et al., 2020). Similarly, other grassroots initiatives called cannabis social clubs developed to model "collective self-supply" have illustrated the need for and importance of peer-to-peer distribution programs (Pardal and Bawin, 2018). Prior research has found that cannabis is unlikely to undermine MOUD outcomes from a programming perspective (Lake and Peirre, 2020), thus peer-to-peer interventions which facilitate cannabis use as a cessation aid are effective options worth considering in lieu of formal programs.

4.1. Limitations

This research has several limitations. First, it was conducted in California where cannabis is medically and recreationally legal and may include a study population with greater access to cannabis and thus might not be generalizable to other regions with differing legality. Second, the illicit opioid supply transitioned from heroin to fentanyl during this time and results from our study pertain to non-specific opioid use. We do not believe that this changes how our results on cannabis and opioid use are interpreted. Third, while several participants in our study reported using cannabis for opioid reduction and cessation, inclusion criteria in our study were co-use of cannabis and opioids, indicative that the cessation, when reported, was likely episodic among our participants. Fourth, participants were recruited from methadone and syringe exchange sites which might overrepresent those already motivated and/or able to engage in safer substance use patterns and/or cessation. Despite these limitations, this research provides important insights in guiding interventions for opioid-using and PWID and assessing cannabis as a viable tool for modulation and cessation.

5. Conclusions

In our study, participants reported that cannabis assisted in developing patterns of reduced opioid use by decreasing frequency of opioid administration and providing a buffer period to initiate MOUD. Participants reported using cannabis substitution or co-use to manage the pain from withdrawal symptoms, such as body aches and generalized discomfort, which led to decreased opioid injection frequency. Participants emphasized low-barrier access due to legalization and numerous dispensaries as a resource that facilitated co-using cannabis for reduced opioid use. These findings support the extant literature on cannabis and opioid co-use for pattern changes among vulnerable populations. Nonetheless, carefully controlled studies that examine these connections between cannabis use, intentions, and utilization patterns are needed to establish the value of cannabis to opioid-using PWID. Our data provide an initial exploration for future studies examining these connections

among PWID experiencing inequities such as housing insecurity and material deprivation. The majority of the literature on this topic is quantitative, and we believe that our qualitative findings from this community-recruited sample provide a much needed perspective on cannabis-opioid co-use from PWID.

Author disclosures

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CRediT authorship contribution statement

Siddhi S. Ganesh: Writing – review & editing, Writing – original draft. **Rachel Carmen Ceasar:** Writing – review & editing, Project administration, Methodology, Investigation, Conceptualization. **Ricky N. Bluthenthal:** Writing – review & editing. **Jimi Huh:** Writing – original draft. **Erin E. Gould:** Writing – review & editing, Writing – original draft. **Bradley T. Conner:** Writing – review & editing.

Declaration of Competing Interest

Authors report no potential conflicts of interest.

Data Availability

The data is available from the corresponding author and principal investigator upon reasonable request.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.dadr.2024.100257.

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